ONE DOLLAR

NATURE IN RECREATION

AQUATICS DANCE MUSIC

DRAMA CRAFTS GAMES CAMP

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SCOUTS OF U.S.A
Pacific Northwest
Burlingame, California
National Branch
815 Seaboard Bldg.
Seattle 1, Wash.

Marguerite Ickis

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NATURE IN RECREATION

By the Same Author

ARTS AND CRAFTS: A Practical Handbook

NATURE IN RECREATION

BY

MARGUERITE ICKIS

A. S. BARNES AND COMPANY

NEW YORK

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CONTENTS

INTRODUCTION vii

FOREWORD ix

NATURE IN CAMPING—*Section I*

Make Your Camp Nature Conscious 3
A Nature Plot 5
Outdoor Museum 7
Collecting Rocks and Minerals 13
Collecting Hints 17
Nature Hikes 20
Photographing Flowers 27

NATURE IN HANDCRAFT—*Section II*

Nature Motifs Applied to Design 33
Nature Notebooks 38
Plaster Casts from Mud Pies 41
Modeling Your Pet 41
Pinhole Telescope 42
Barometer 42
Cardboard Printing Frame 43
Nature Prints 44

NATURE IN GAMES—*Section III*

Nature Jackstraws 53
Pierrot Top 53
Bird Flight 54
Ball and Reed Game 55
Corncob Dart Game 55
Nature Arches 56
Nature Skittles 56
Handkerchief Sling 57
Tree Graph 58
String Game 58

NATURE IN DRAMATICS—*Section IV*

Lantern Slides 63
A Nature Theatre 64
Puppet Shows 65
Nature Conservation 71
Animal Track Campfire 72
Simple Masks 72

NATURE IN MUSIC—*Section V*

Cornstalk Fife 78
Pan Pipes 78
Gourd Instruments 79
Marimba 79
Shepherd's Pipe 80
Shell Trumpet 81
Wishbone Harp 81
Squash-Leaf Oboe 81
Songs With Nature Themes 82

NATURE IN DANCING—*Section VI*

Dances for Seasons 87
Other Nature Dances 89

NATURE IN AQUATICS—*Section VII*

Nature at the Shore 95
The Barometer 96
The Weather Vane 97
Hygrometer 97

NATURE CRITERIA 101

BIBLIOGRAPHY 107

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INTRODUCTION

THE PURPOSE of Nature in Recreation is two-fold: first, to inject fun into a recreation program by introducing Nature through the different activities and, second, to indicate some workable approaches and methods that will create an "awareness" of living things in the world about us. There is no intention here to stress microscopic examinations, give names by the score, catalogue species, or attempt scientific classifications. It is hoped that this book will be the means of introducing Nature to hundreds of boys and girls in a friendly, intimate fashion.

Since the conservation of natural materials has become so vital a problem in American life, the spirit of "letting live" and learning to know the nature objects in their natural settings is carried throughout the book. The young naturalist will find many suggestions for carrying on his study of living things without possessing them, and the chapters on Handcrafts and Photography will give him information on how to keep data and records without picking specimens for collections.

If Nature in Recreation can give a knowledge and enjoyment of *living* things and the *way* they live without destroying them, it will have given to youth one of the greatest possible gifts.

FOREWORD

I WAS ORIGINALLY asked to review a first draft of this material for critical evaluation. I found that the content matter was absorbingly interesting and carried me along to the last page.

The organization of the material lends itself to effective use for the leader or Administrator in Recreation, with a hundred and one suggestions for utilizing new materials and giving new ideals of the effective use of nature as a fascinating media for recreational purposes.

This book, I am certain, will find a real place in the literature on Recreation.

The content and method of presentation grows out of a wide and rich experience gained by Miss Ickis as a leader in nature exploration, crafts and recreation; and as a teacher of teachers. All people concerned with the guidance of young minds should go through this material, which is fascinating and indicative of the wide scope of Nature in Recreation. For those who have program in Camping, Handcraft, Games, Dramatics, Music, the Dance or Aquatics the volume should find particular use as a reference work and will be an invaluable text.

FRANK S. LLOYD
Professor of Education
New York University

Section I—Nature in Camping

NATURE should fill one of the most important parts of the camp program because it is there that the child finds everything growing in its natural setting. Other parts of the camp program such as dramatics, handcraft and dancing have been adapted to camp use, but nature has a natural right to be there. Because there is so much source material written on them already, such as nature trails, games without equipment, museums, etc., many important nature activities are not mentioned in this book. So this space is given to more unusual and perhaps less used projects. The nature activities mentioned here should stimulate the leader to look for additional material to incorporate with the following suggestions.

MAKE YOUR CAMP NATURE CONSCIOUS

The nature counselor can use many subtle ways to interest children who come to nature camp. One of the favorite methods always has been to build a nature means where, it is hoped, all campers will come to see displays and be inspired with a desire to find out more about nature. Very often the building which usually has been devoted to this purpose is unattractive and not very stimulating, a long way from the center of the camp ground. Why not have your nature displays in a cabin where the campers congregate or in the dining hall where everyone meets three times a day? Attractive displays can be placed over the fireplace, on window sills or porches; or flowers and ferns might be transplanted to add beauty to the landscape gardening. It is important that you keep your specimens fresh and change the water often in the aquariums.

In trying to make the whole camp nature-conscious one should plan the program to include all the campers, not just nature students.

The following suggestions should start thoughts of other ways to stimulate interest.

A Bulletin Board hung in the spot where campers congregate is one way. It is important to have the displays changed often and always is more interesting when living plants are included with the exhibit rather than mere printed matter. The background should be made of soft wood or covered with a material into which thumb tacks easily can be forced. The diagram suggests a board with small shelves on which can be placed rock specimens, seed pods, pine cones or anything you wish to display. The small test tubes on

the side will hold water to keep flowers or plants alive for several days. The hooks at the top may be used in various ways. Ample space should be allowed for weather charts, coming events, bird migrations or nature activities. Nature pictures or small posters will add further color to the board.

Label the Trees and Flowers in the camp ground. There are several methods of making attractive labels, but first of all it should be decided whether you want them to last only one season or to be permanent. Temporary ones usually are printed on cardboard with India ink and made water proof with white shellac. Permanent ones are printed on wood or metal. The shapes of the labels can be varied by cutting them into the shapes of the leaves or flowers of the plants on which they are to be placed. If naming trees it would be helpful to have the labels cut in the shape of the fruit found on the tree part of the year. Double labels are helpful in training and are made by cutting a piece of cardboard 3″ x 4″ and folding it in the center as shown in the diagram. A question is printed on the top piece and the answer underneath.

Label Woods Around Camp—What kind of wood is in your table, victrola, bowl, matches, etc? Label them so everyone in camp can identify them. Identify the wood in the wood pile, making note that the soft wood burns quickly and is for kindling while the hard wood is for coals. Place notes on the various trees in the camp ground telling what their wood is used for commercially.

Nature Poetry should be used whenever possible. A nature poem might be read as a grace at meal time, or at the close of campfire; or nature poem

posted on the bulletin board and made into illustrated posters. Read them to the children in your nature group and encourage them to make poem collections for their notebooks.

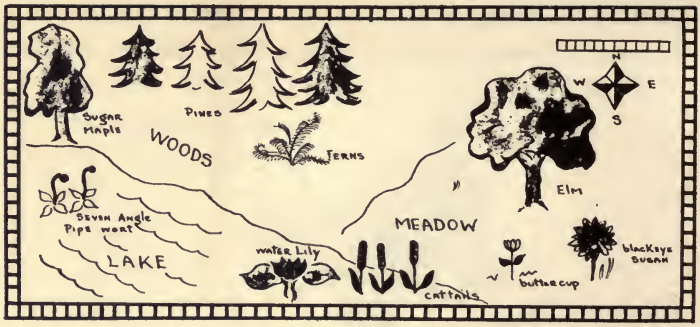
Decorate the Tables—Keeping the camp tables decorated and changing the flowers offers a good project for the nature group. The nature students are familiar with the wild flowers and know which species are plentiful so that no rare ones are picked.

Floral arrangement is another important part of the program which such a project should include, each flower in the centerpiece being labeled so that the campers at the table can learn its name.

Every once in a while it is well to surprise the campers by enclosing a leaf in their napkins and asking the head of each table to see if all the children know the name of their leaves. Attractive place cards can be made also by using such natural materials as fruits or shells.

A NATURE PLOT

An excellent way to introduce nature to a beginner is to mark off a small plot of ground, say 100 paces or more square, and identify all the plants growing on the plot. This may be used for individual study, or for a group of children working together. The method is good because it limits the field of nature to a few square feet of ground and keeps the child from becoming bewildered or discouraged. On the plot there should be three or four species of trees, a half dozen flowers, a few ferns, some moss, etc. This gives the child experience in identifying in several fields of nature and at the same time enables him to decide which is the most interesting for him if he wishes to pursue his study at a later date.



The plot is not limited to the trees and plants that are growing on it, but offers all kinds of adventures in animal life. Just by turning over a stone new insects might be discovered. Or a record might be kept of the butterflies and other insects that visit the plot during the camping period. Birds also will visit the plot and some may build their nests low enough for study. Or if a lake or stream borders on the plot, a search along its banks would uncover aquatic life that might offer material enough for filling an aquarium to take home and enjoy during the winter months.

The making of a picture map of the plot as a final study adds likewise to the value of the project. A compass used in pacing the plot and drawing the map allows for marking north at top of the paper, south on the bottom, east at the right, and west on the left. The pictures of the flowers, trees and so on may be placed on the map by simply judging the distances. Measurements do not have to be perfectly accurate. The child unconsciously sketches in the shapes of the trees, the number of petals on each flower, etc., so that it is not necessary to tell him to do so—which sometimes is too discouraging for the beginner. The map is attractive in colors.

A group might want to spend several weeks studying its plot, in which case it should choose one that presents a problem to be solved other than identification. The plot might border on a lake, for instance the children could separate the aquatic plants from the land plants and study their contrasting characteristics. Note that a road or a trail running through the plot often changes its vegetation. If trees and shrubs are cleared away it lets in more light and brings in the meadow flowers. Since man often drops foreign seeds and minerals while traveling along the trail and it is frequently possible to find wheat growing in the middle of the woods or a piece of coal many miles from where it was mined! A plot half in the woods and half in the meadow also makes an interesting study for differences in plants.

OUTDOOR MUSEUM

An outdoor museum can be an all-summer project of special interest to camps or day camps that are limited in space. Such a museum offers a substitute for a nature trail to campers who have made nature trails for several years and are looking for something new, or it may also take the place of an indoor museum.

A sheltered spot in the woods near the camp where the children can drop in at any time to help with the planning and construction is the most suitable location. It should have an attractive entrance and include space enough to eliminate crowding the exhibits and permit the children room for play. Everything should be well labeled so that a person can go in alone and know what it is all about.

Labels

The labels go well on white cardboard printed with India ink. After the ink is thoroughly dry, cover both the front and the back with white shellac to make them waterproof. Such labels will last for one season if at all sheltered by the trees. Permanent markers are made by cutting a piece of tin or other metal to the desired size and painting on it with black asphaltum. A coat of shellac keeps them more waterproof and prevents rusting. Labels for trees are made more attractive by cutting them in the shapes of the leaves on the trees to which they are to be fastened. Sew the label on the tree with white thread whenever possible.

The following projects are suggested for an outdoor museum. Many more may come to mind as you work along, and always use the ones suggested by children themselves. Other campers besides the nature students will find pleasure in working in the museum. Those interested in art can make the posters: others who like to handle tools will want to do the constructing; the little ones will prefer to dig in the dirt. Find a job for everyone.

A Bird Cafeteria

Place a board between two trees about six feet from the ground, or if you have another board or two put up several shelves. By laying grain, bread

crumbs, berries or suet on the boards for the birds it becomes a "Bird Cafeteria." A dish of water at one end serves as a beverage. Suet of course is the meat dish, the bread and the grain the main meal, and berries the dessert. Different bird menus may be tacked along the boards to suggest that all birds do not have the same diet. Thus the children will learn that some feed almost exclusively on insects, others on grain, and still others on an equal amount of each. A picture of the bird at the top of the menu makes it more colorful. Be sure to feature only birds found in your camp locality. Keep a record of the birds that visit the cafeteria.

Medicine Chest

Take an orange crate that already has a shelf, and cover the front with a door. Paint "Medicine Chest" on the front and fill it with any medicinal herbs to be found in the neighborhood. You should find boneset, sassafras, witch hazel, elder and many others. You might also add some minerals such as lead, which is used in the making of adhesive, and iron found in iodine. The herbs can be diplayed in various ways. Perhaps the nurse will be good enough to donate a small bottle of the medicine and you can display the plant just back of it. Another way is to press the plant, mount it on a piece of cardboard and cover with cellophane.

Woodland Pantry

A pantry might be made either by building a cupboard like the one illustrated above, or by piling several orange crates on top of each other

and nailing them together. Gather plants or herbs that are edible or might be used for medicinal purposes to place them on the shelves. Be sure they are well labeled, giving name, use, and other information you can find. Keep in mind that in a real pantry things that are used very little are placed on the top shelves, the perishable ones are on the middle ones where they are easy to reach and the dried herbs underneath. If berries or other perishable plants are used, be sure to change them often so they will not attract insects.

Fernery

A fernery is made by transplanting ferns that are found in the neighborhood in one corner of the museum, preferably near a stream. Dig up the ferns carefully, leaving the roots covered with earth and replant them as quickly as possible. Small paths made of stones should lead through the fernery so visitors will not step on the ferns. Each species of fern should be well labeled, giving the name of the fern, its habitat, range, etc. Poems about ferns could be printed on cardboard in India ink and shellacked.

Zoo

Since it is against the law in many states to cage animals and the proper care of them is a real problem, why not build a zoo that will take care of itself? The Museum of Natural History has a display of wild animals that were stuffed and placed in their natural setting. The same plan might be used in making a zoo for your outdoor museum. Get a number of wooden packing boxes and paint them green if you can; otherwise leave them plain. Draw the animals that frequent your camp site on cardboard, cut them out and paint them. Cover them with white shellac so they will be waterproof. The inside of the box should be painted to show the natural setting of the animal; that is, the frog should be near the water, the chip-munk in the woods. Other studies are possible of the food they eat with samples placed in the box. A list of enemies or any other information could be tacked on the outside. Somewhere in the zoo have posters telling how to handle different animals, their use, games, laws.

Sakakawea's Trail

Sakakawea was the Indian woman who led Lewis and Clark on their expedition through the Northwest. She knew the names and songs of all the birds and for this reason her name might be used for a bird trail.

Divide the more advanced nature students into groups of two or three and assign one bird to each group. Then ask each one to find all the information he can about that bird. This would include the kind of nest, a drawing of the bird, samples of the food, etc. When the study is completed assemble the material and place it along the trail. Shellac the posters and cutouts to make them waterproof. Be sure to select only birds found in your neighborhood.

Star Circle

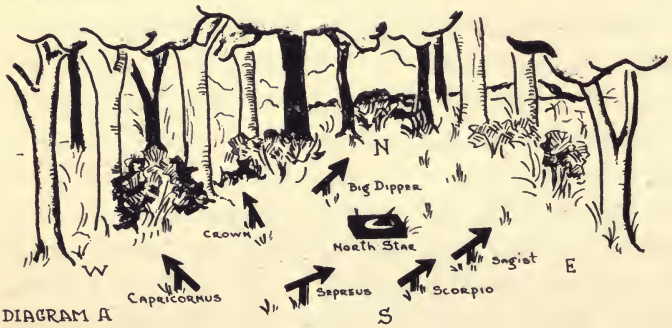


DIAGRAM A

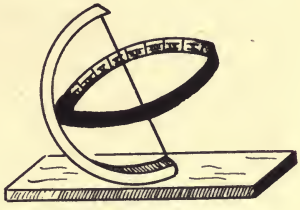
DIAGRAM B.

Find a small clearing near your outdoor museum that can be used for star gazing at night. Cut away all small brush and keep the grass short so that the children can sit on the ground while star gazing and will not be annoyed with the insects.

By indicating where to look for the different constellations the circle can be made into a chart to represent the sky. Drive stakes or sticks into the ground on which tin arrows are attached at the top. Twist the end of the arrow around a nail and drive it into the top of the stick as shown in the diagram. Have the arrow point to the part of the sky in which the constellation printed on the side can be found. The arrows will have to be moved as the seasons change, or according to the time of evening you do your star gazing.

A large star box might be kept in the circle for teaching purposes while the group is waiting for the stars to appear. An ordinary wooden box with a coat of paint will be attractive. Decorate it with gummed stars. Cut as many pieces of cardboard as there are constellations you wish to study, making them the same size as the opening of your box. Cut stars about half an inch in diameter. They are spaced to form a constellation. Paint both sides of the cardboard with black paint and shellac.

When using the star box place a flashlight or candle inside and cover with one of the star charts. The light will come through the stars, thus showing the general shape of the constellation.



Still another project that might be added to the star circle is a sun dial. A simple sun dial can be made by cutting a strip of tin two inches wide and 25 inches long.

Mark off a half inch at each end for overlapping and divide the rest into twenty-four one inch spaces to represent the twenty-four hours in one day. Make the lines with black asphaltum paint, but do not put in the numbers until later.

Next get a strip of metal 13 inches long and bend it in a semi-circle as shown in the diagram. Part of a barrel hoop will serve equally well. Drill a hole in each end and one in the center, to which the other piece of tin is attached so it will form a circle. Run a wire down through the center and fasten to each end of the semi-circular piece. The wire will cast a shadow onto the large hoop. Fasten the bottom of the semi-circle to a large board or the trunk of a tree. Observe the sun dial and see where the shadow falls at twelve o'clock noon and mark it in the circle; the other hours should

follow one inch apart but make sure by observing one whole day and marking the location at the beginning of each hour.

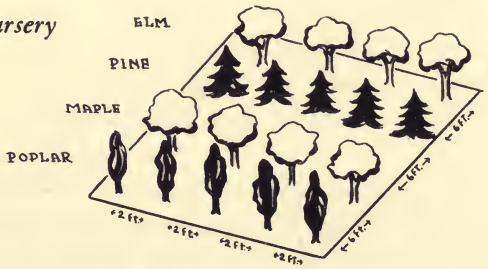
Wood Pile

During the early part of the past century every farmer had a wood pile from which he drew fuel for his fireplace during the long winter months. He knew that soft woods burn easily and quickly, so he usually cut them into very small pieces for kindling. The hard woods would burn much longer and turn into coal, so they were cut into large pieces that would burn several hours. All the wood then was placed in neat piles with stakes driven in on both sides to keep them in place.

There was no need for the farmer to label his wood because he knew the quality of every stick.

Why not have two wood piles in your out-door museum, one of hard wood and the other of soft? Pile the pieces into a neat pile and attach a label to each piece as shown in the illustration. Besides giving the name of the wood, other information such as its use, ranges, and habitat might be included.

Tree Nursery



First of all make a survey of the camp grounds and see what trees are needed for re-forestation. Here are a few hints to follow:

1. Trees for shade
   All kinds of Oaks
   American Elm

Horse Chestnut

2. Trees for dividing lines
   Lombard Poplar
   Pines
3. Trees that feed birds
   Staghorn Sumac
   Wild Cherry
   Mountain Ash
4. Trees for landscape gardening
   Gray Birch
   Arbae Vitae
   Red Cedar
   Hemlock
   Spruce Pine

So there will be plenty of sunlight, choose a spot for your nursery in a clearing near the outdoor museum. The soil should be sandy so that the young roots can penetrate easily and enlarge their rooting systems. Dig up the young seedlings, being careful to keep all the soil around the young roots so they will not wither. It is best to wrap a piece of damp cloth or burlap around the roots until the trees are transferred to the nursery.

It is best to plant the trees in rows about two feet apart as shown in the diagram. If it is desired to plant the seeds themselves, you might reserve one corner of the plot for that purpose. The seeds may be planted much closer together because it is advisable to transplant them in rows as soon as there are enough.

COLLECTING ROCKS AND MINERALS

That magpie instinct that urges most people to collect things and to board them for their own is manifested by those who collect book match covers, stamps, bottle caps, autographs and hundreds of other items. These objects are the product of someone's labor and are treasured on a wholly artificial base—scarcity and demand. Their permanency is measured in weeks or a few hundred years at the most.

There are things worth collecting, however, that will repay the possessor a great deal more than the mere satisfaction of ownership, objects as durable as the earth itself that man has never seen before your own eyes discovered them. They become yours by right of intelligent search and discovery, not because you had more money than the other fellow or were a

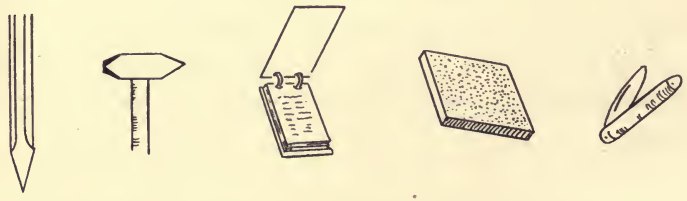
better bargainer. Such objects often unfold a wonderful story that constantly grows more fascinating as you learn to understand its language, a story of raging torrents, ocean depths, volcanoes.

Collecting rocks, minerals and those flowers of the mineral world—crystals, is a fascinating hobby. The art of collecting and cataloguing can be just as important or just as casual as you want to make it. One can collect "pretty stones" or spend years in building up a collection of quartzes. Also one can exchange with collectors in other countries or confine oneself to acquiring a complete display of the minerals in one's own locality.

How to Start a Collection

There are a number of ways to become acquainted with the mineral world. Read books on the subjects. F. B. Lomis's Field Book of Common Rocks and Minerals is a good one to begin with. Join a mineralogical club if there is one in your neighborhood. Ask the science teacher about minerals. Study the exhibits in the museums. Send for the beginner's sample kits and see if you can recognize any of the stones. Join an organization like the Rocks and Minerals Association.

Equipment



The field equipment is very simple and can be improvised for almost nothing. Or it can be bought from a scientific supply house for less than two dollars. You will need:

1. A hammer, geologists or a cross pein with about a twelve ounce head.
2. A cold chisel.
3. A streak plate or piece of unglazed porcelain.
4. A pocket knife.
5. Some small bags or wrapping paper.
6. Some cotton batting or rags.
7. A notebook.

With this equipment, serviceable clothes and a pair of old gloves, you are ready to go prospecting.

Prospecting

If there is snow on the ground you will not find many specimens unless there happens to be a windswept out-cropping of rock to study. The best time of the year for prospecting is early in the spring, before the vegetation covers the ground and right after the spring thaws have loosened up the ground and created landslides exposing new mineral locations.

Quarries, mine dumps, road cuts, subway dumps or any place where newly exposed rocks are to be found are good places for the amateur prospector. Rocks and minerals and particularly crystals deteriorate, just as anything else does upon long exposure to the rain and weather; so your best samples will be found in newly exposed surfaces. At some places along our coast the sea washes up many stones of gem-like quality. If you are in the country you can try prospecting the streams, as do professional prospectors. Examine the stagnant backwaters of the stream for likely looking minerals. If you look closely, you will find minute samples of most of the minerals existing in that part of the country. If the samples are large the source is not far away, but if they are small they have probably been washed from much further upstream. Work upstream examining the pools. Your samples should get larger and larger and finally disappear. The source of that mineral is somewhere between your present position and the last pool where you found samples, so look around—perhaps the "mother lode" is up a side stream or up on the hill on either side of the main stream where fragments have been washed down by winter storms.

Collecting

After you have found a promising looking spot, use your hammer and chisel to break out the best sample you can get. Be very careful not to destroy your specimen by careless blows of the hammer. If there are crystals try prying rather than chopping so as not to dislodge the crystals from their matrix. Give the sample a number immediately and enter into your notebook what you think it is and where you found it. If there are any more materials, collect a few more samples for your exchange supply. Put the specimens in individual wrappers and if they have delicate crystals on the surface wrap them in cotton batting or old rags so that they will not be spoiled on the trip home.

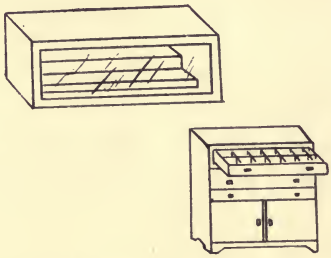
Preparing a Specimen

In the evening and on inclement days you can open up the bags that you filled on your field trips and prepare the specimens for cataloguing and mounting.

Carefully chop or break away the surplus stone around the "important" part of your specimen, then clean it with soap and water and a brush, unless it is too fragile for brushing. Procure a mineral table and with your unglazed porcelain—streak plate—and by its other characteristics try to identify the stone. If you are not sure what it is, ask your teacher or the local museum, sometimes the local scout troop can be a big help in identifying stones and telling you of good prospecting ground. After you have identified the specimen give it a number, enter the number in your notebook with all the information you have about the specimen; where you found it, what it is, its chemical composition, what the matrix is, etc. Something like this:

108 Smoky Quartz xls and Biatite on Feldspar
Perfect quartz xls biatite broken
Found Sunday April 24, 1938 on a ridge one
quarter mile south of the largest old
Kensico Dam quarries.

Mounting



After you have cleaned and identified the specimen, the next problem is how to store it. Of course you can wrap it up, put it in a box and hide it away in a closet. It would be a shame to do that though after all the work you have done to get it so we had better try to figure some way to make an attractive display out of all the specimens and leave room for additions as our collection grows. A visit to the museum will give you several ideas on mounting minerals, and you will be able to work out something that suits your own needs as regards space and the opinions of the rest of the family. You can make or buy a chest of shallow drawers and put compartments in them for each specimen, then put a little cotton batting in each compartment to keep the specimens from being spoiled if the drawer is ever slammed shut. If you can find a book shelf with glass doors, you can make a deluxe mineral cabinet. Put smaller shelves in it built up like stairs and then mount your specimens on pedestals, shallow trays, in small vials or numbers of

other ways. The bases and pedestals can be made of blocks of wood painted, or if you need a lot the same size, cast of plaster. The trays can be made of paper, tin, sheets of glass or jar caps. Make neat uniform small labels to go with each specimen.

Do not crowd the specimens too closely together; spread them so that they can be seen from several sides and arrange them so that there is a pleasing contrast in color or shape between one specimen and the next. Later on when your collection has grown enough you will want to arrange them according to one of the systems used by advanced collectors.

COLLECTING HINTS

It is against the law in many states to pick flowers or ferns. Nearly every city and state park has the same conservation laws, otherwise there would be nothing beautiful left for others to see and enjoy. Do not pick a flower unless there are many more left like it, and never pull it up by the roots. If you have the collecting urge, why not make a collection of leaves, grasses, weeds, etc.? It is important to know them too. Ferns may be collected if you are careful to pick one from a clump and not too near the root. A bucket is a good thing to take along if you are not going too far on your trip, because you can put some moss and damp earth in the bottom, and keep your specimens fresh until you get home.

A Collecting Press

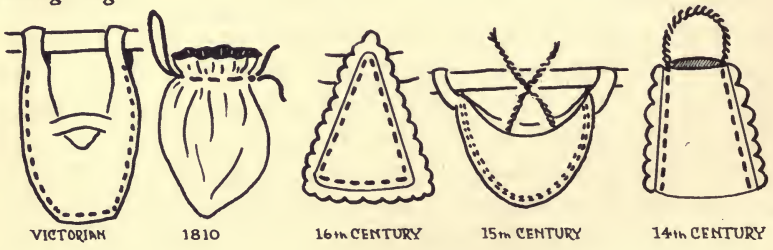
It is important to have nature specimens fresh when they are put away to press—also they must dry quickly. A simple press may be made by knocking off two sides of an orange crate and smoothing down the edges. If you are going to collect small specimens take the two ends instead. Make a filler for the inside out of layers of large pieces of blotting paper if you can afford it, and if not use newspaper, which will readily absorb the

moisture. Buy a luggage strap at the ten cent store to hold it together. The buckle will make it convenient for opening and closing. It would be better to have two straps, one going around each way, if you can get them.

Mounting

To mount pressed leaves or other plants, mix glue with one part vinegar and smear rather thickly over a piece of glass. Lay the dried specimen on the glass and press it down gently until the back of it is covered with glue. Now transfer it to your notebook, cover it with a piece of paper and again press it gently with the hand so the whole surface is glued onto the page of the notebook. This method eliminates using a paste brush which breaks the specimen when it is brittle.

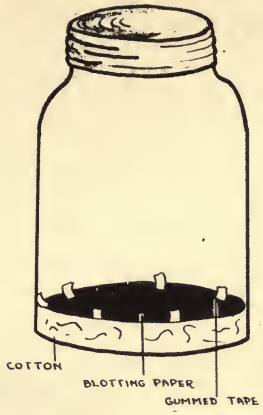
Collecting Bags



A bag that can be worn on the belt or carried on a strap that goes around one's shoulder will save many nature specimens found on hikes and bring them home safely for mounting. The five bags pictured above are ones copied from old fashion magazines and are labeled according to the century in which they were worn. Bags should be made large enough to hold a number of specimens yet not large enough to become clumsy while wearing them on a hike. Leather of course makes the most attractive bags and are not very expensive when made from scraps. They may also be made from inner tubes, burlap, canvas or any other material that is durable.

Insect Killing Jar

Instead of using cyanide as a killing fluid in a jar it is better to use carbon tetrachloride as it is non-poisonous, non-inflammable, and kills the insects rapidly.



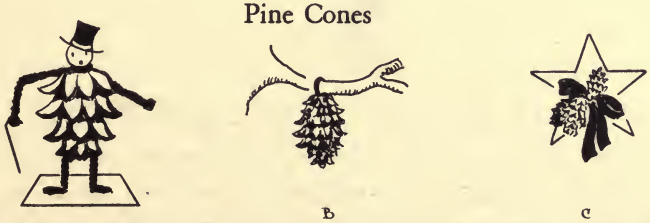
Construction—Into a jar that has a tight fitting lid pour enough plaster of paris to form a pad on the bottom about ¾ of an inch thick. The plaster of paris is porous and will absorb the killing fluid. Another method is to place some cotton in the bottom of the jar and cover the top with a piece of blotting paper as shown in the diagram. Hold blotter in place with pieces of gummed tape.

"Carbona," a cleaning fluid, is easy to obtain and may be used instead of carbon tetrachloride.

Collecting for Winter

Why not look forward to your winter activities by collecting natural materials that can be dried or preserved for later use, ones that might be utilized for crafts, bird feeding stations, Christmas tree ornaments, winter gardens or numerous other things? The suggestions given below are offered just to stimulate thought of a dozen other items to gather.

Pine Cones



Pine Cones of all sizes and shapes are used in various ways. The little ones if combined with pipe cleaners make animals for your table decorations or place cards. (Diagram A)

Large Pine Cones make excellent bird feeding stations by turning them upside down and pouring in melted suet in which seeds and grain have

been stirred. When it hardens, hang the cones on trees and shrubs in your yard. (Diagram B)

If you paint the pine cones in colors, or gild them with gold or silver, they make beautiful Christmas tree ornaments. They may also be woven into wreathes or a bunch tied together with a red ribbon becomes a decoration for your door. (Diagram C)

Shells

Shells come in so many sizes and shapes that there are a dozen ways to use them. The large ones make very good dishes for winter gardens or bulbs as shown in Diagram A. Small ones make attractive Christmas tree ornaments if painted or gilded in colors. Pierce them with a small hand drill and string them together with silver or gold cord. (Diagram B) The Handicraft teacher would appreciate a dozen shells for paint dishes if they were about three inches long and shallow. (Diagram C). The larger ones may be used for individual bake dishes, and are especially appropriate for the serving of sea food. (Diagram D)

Dried Seed Pods

Dried Seed Pods can be used in various ways. Such plants as the poppy, milkweed, honey locust furnish large pods that may be painted in colors and strung in a large cluster such as the ones you see in the florist or Mexican shops. They are hung on porches, kitchen or breakfast room to add color.

NATURE HIKES

Nature hikes may be varied in so many ways that they are used very often for studying nature. Nature "walks" would probably be a better term

to use, as the word "hike" implies tramping along a trail with no time for observation. On the other hand "a walk" usually leads only to places near home while the nature student wants to venture afar for his specimens.

There are several points to consider when planning a hike. One is that it should have a purpose or a theme and should be planned ahead of time. Another important factor is the time of day during which it is to take place. Many hikes are planned in camp for early in the morning before breakfast, the theory being that the birds sing better and the flowers look fresher at that time of day. The fact is that the birds sing equally well during the other parts of the day, especially in the late afternoon and evening; so the only point in taking a bird walk in the morning is for an adventure or because there are fewer people around to disturb the birds. Children are at their low ebb in the morning and should take very little exercise before eating.

Many nature counselors take their children on nature hikes just before lunch when it is the hottest part of the camping day. This should make any child dread going to the nature class. It would be much better to select a cool spot near a stream where they can explore a small area. Morning is also a good time to work in the museum on nature notebooks. After supper is an excellent time for a nature walk or a row around the lake to collect nature specimens. It will keep some children from being homesick and tide them over until camp fire time.

Hiking with a Theme

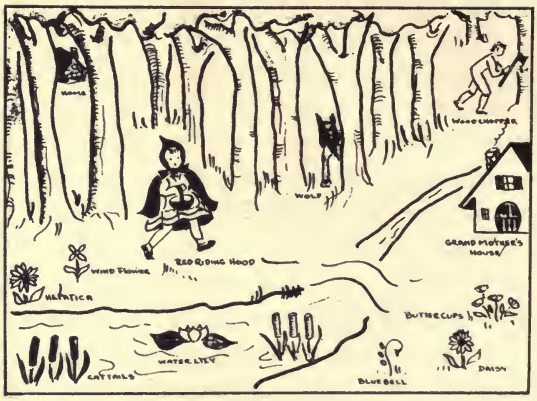
Children love to plan a hike around one theme and the field of nature offers endless possibilities. If a group goes out to study one subject such as "trees with compound leaves" or "similar plants" it narrows down the nature field so that the leader can keep the children's interest in one channel, thus keeping the hike under control.

The following are several hikes "with a theme" that have been used successfully in some of the summer camps, and are given as suggestions only. They should enable the nature counselors to work out some theme of their own:

Fairy Stories

Nearly every fairy story having a nature theme as its setting is placed in the forest, along a stream, or along a trail. Many details were left out of the stories as handed down from generation to generation; so the only way even to guess what they were is to go back to nature and study her ways. Picture maps may be used along with the study. Several suggestions are given on following pages:

Little Red Riding Hood

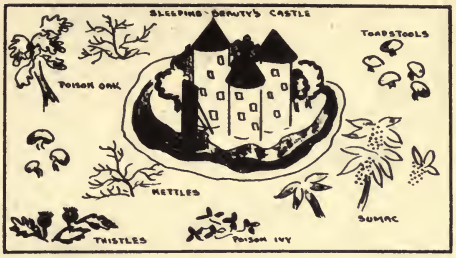


We have been told that Little Red Riding Hood was gathering flowers on her way to her grandmother's, but no one has ever mentioned the names of the flowers she gathered. The only way we can even *guess,* is to know something about the territory in which she lived. If the path were entirely in the woods she would have found only flowers that grow in the shade. On the other hand, her father was a wood chopper and she might have passed through a clearing which would offer daisies or other meadow flowers. If she crossed a stream, she would have found still a different kind of flower. Discuss this with the children and suggest they go on a "Little Red Riding Hood Hike" to see if they can find the flowers that she might have gathered. Point out the fact that they will find only certain flowers growing in the woods, in the meadows, etc., and choose a path that will lead through the three types of territories. Since Little Red Riding Hood was wearing a hood, it might be suggested that her adventure took place while the weather was cool. This would then be a good theme for a hike in the spring or fall. A Little Red Riding Hood Hike may also take place indoors on rainy days. Place pictures of flowers around the room and have a sign "Red Riding Hood's Home" at one end and "Grandmother's Home" at the other. Designate a stream and a meadow somewhere and place pictures of flowers that one could find growing there. The children might wear red hoods made from crepe paper.

Sleeping Beauty

According to the story as we have it today, Sleeping Beauty was asleep in a castle for a hundred years and the plants grew up around the walls so that no man could enter. No one has ever told us the names of the plants

that grew around the wall. We can only guess that they might have been poisonous, covered with thorns, ones that sting such as nettles or thistles.



There might also have been vines that intermingled so tightly one could not pass. Select a circular trail to represent the wall around Sleeping Beauty's Castle and study all the plants that are poisonous; vines, etc., that might have protected the castle.

Pied Piper of Hamlin

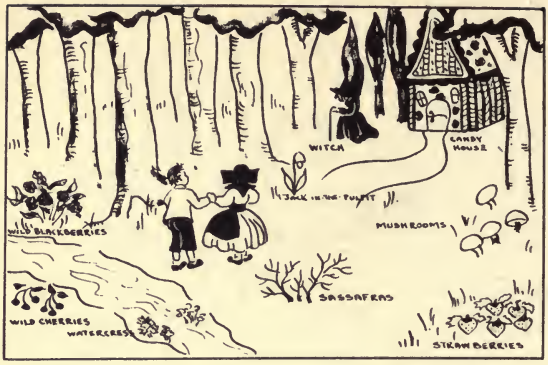
The Pied Piper of Hamlin played such beautiful music on his pipe that everyone would follow him wherever he went to hear him play. This theme might be used for a hike. The leader would be the first Pied Piper at the beginning of the hike and everyone would follow, of course. The music part would only be pretending. During this time everyone would look around for something new in nature and when the Pied Piper stopped it would be decided who had made the most original discovery or observation. That person would then become the Pied Piper and lead the group. This is repeated until the hike is completed.

The Three Bears

The Three Bears has several possible themes for a nature hike. For instance the hikers might start out to find what nature did for the bears and Goldenlocks. They could find edible plants for their porridge, clay for their bowls, wood for furniture, feathers for pillows, etc.

Hansel and Gretel

Hansel and Gretel—If Hansel and Gretel had been a Boy Scout and a Girl Scout they would have known what plants are good to eat in the woods and would not have had to eat from the Gingerbread House. This story is a good theme for the study of edible plants that can be found in your



woods along the streams. It would be fun to have the group rewrite the story so that it ends differently and dramatize it for the rest of the camp. They could bring in all the edible plants, tell what part they ate and how they prepared them, thus outwitting the old witch!

Other Hike Suggestions

Jack-Knife Hike

Cut jack-knives from two colors of paper and fasten one of each color to plants or trees on which a jack-knife might be used for some purpose along a trail. It might be a tree that would make good timber for fires because the wood is soft, or if the wood is hard it would be used for coals. Edible plants might also be prepared for cooking with a jack-knife. There are dozens of ways of using one when you stop to think about it.

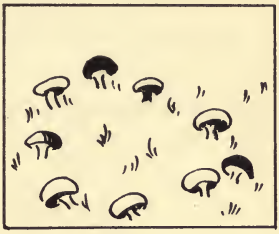
Divide the children into two groups and explain that they may remove a jack-knife if they can explain in what way one might be used on that particular plant. Check at the end of the hike and see which group has the most knives and which has given the best answers.

Fairy Ring

This theme is suggested for a luncheon hike. There is a species of mushroom that has its spawn growing out in all directions so that the mushrooms

grow up into rings. Tell the children about it and read about it in your nature books. After they have discussed it among themselves and are really interested, suggest they go out some morning and try to find one fairy ring.

WALK 10 STEPS FIND FAIRY PEEP ON STAR MOSS
WALK 15 STEPS FIND BETWEEN TWO FLOWERS
WALK 10 STEPS FIND TWO BIRDS ONE TANK
WALK 20 STEPS FIND FAIRY CAUGHT ON LOCUST THORN
WALK 25 STEPS FIND FAIRY BEHIND LITTLE FERN



Prepare a check list ahead of time of things in nature that might pertain to fairies and see which group can see the most along the trail. The following is a suggested list: Frog, Spider Web, Mushroom, Moss, Fairy Cup, Butterfly, Blue Bird, Rabbit.

At one spot along the trail arrange a dial something like the one shown in Diagram A and have the children follow directions. If it is not yet lunch time they might play some familiar games to which a fairy theme has been applied.

Of course you will not find a Fairy Ring unless you are fortunate enough to have one growing in your woods and that is where the lunch becomes a part of the hike. Pack the food in large paper bags and when everything is in the bag twist them in the center, spread the tops open and round the edges down to make them look like mushrooms. (Diagram B) Take them to the spot in the woods where you plan to have your lunch and place them around in a circle to resemble a Fairy Ring. They look more realistic if the lower part can be surrounded with grass. Explain to the children that you could not find a Fairy Ring and you didn't want them to be "too disappointed" so you were giving them an imitation instead. One Camp used this idea for a Sunday Evening supper and had a fairy play for the evening's entertainment while they were still in the woods.

Themes for Adventures Afield

Young people often dodge "nature hikes"—probably because the term sounds so dull. Why not quicken their curiosity by such enticing themes as these? Add to the novelty by bringing into play senses not often enough used, as:

a. *Feeling.* How many—separate, distinct, describable—can you discover?
b. *Colors.* How many colors?

c. *Odors.* Best tested in midsummer when pungent little annuals are abundant. Test crushed leaves, broken twigs, insects, mushrooms, leaf mold, everything with an odor, good or bad.

d. *Sounds* and sound making devices: a more subtle project for older or more experienced girls. Everything from a cricket or frog to raindrops or wind.

e. *Tastes*—in moderation and with due regard to any poisonous species in your locality.

1. *Pitfalls for the Unwary*—as spider webs and doodlebug traps.

2. *Accidents or Untimely Ends.* Even a rock split by a tree root, a tree cut down by man or blown over by the wind, a stream dammed by a landslide, a leaf partly eaten by an insect, a fern or flowers stepped on by a careless foot.

3. *Discards or Remnants.* Cast off skins of insects and snakes, a fallen leaf, a lost feather.

4. *Locomotors.* Wings, legs, fins, scales of snakes.

5. *Transportation.* What is carried by whom?

6. *Movements,* other than locomotors and transportation—such as mechanical movements in plants and muscular movements in animals. What's moving?

7. *Planters of Seeds.* Birds, mammals, insects.

8. *Tracks, or "sign" or traces.*

9. *Menus,* table manners and table scraps.

10. *Patterns* or designs, as feathers radiate or dot or triangle or wave.

11. *Signs of the Times.* What do you see that is evidence that this is *this* season and no other?

12. *Homes,* home-making and home-makers. Spiders, birds, moles, gophers, mice, and so on.

13. *Skins,* or outer surfaces—from rock surfaces to bark of trees; feathers, fur, scales, leaf surfaces.

14. *Curiosities*—Such as a plant that has pushed up through a dead leaf and carried the leaf up with it.

15. *Oddities*—untypical growth, such as a four-leaved clover or oxalis or a two-tailed lizard.

16. *Miniatures or Inchers*—tiny lovely things less than an inch tall, or queer and interesting little things like the fairy golf-club fruiting bodies on moss or the wee umbrellas on liverworts or seeds with a parachute.

17. *Remnants of Yester-year.* Old birds' nests, dead leaves, ghosts of flowers, fallen seeds.

18. *Squatters.* Who sits on what? Lichens on tree trunks and rocks; barnacles on wharf-piling or crab shells, etc.

PHOTOGRAPHING FLOWERS

Taking successful flower pictures is one of the problems of nature photography which, while not difficult, requires a little understanding of the materials of photography and their capabilities. However, the beautiful results possible with flower subjects warrant the slight effort and trouble required in this direction.

Camera

Let us start first with the camera. Due to the smallness of the flower it is usually necessary to approach quite close to a flower to get an image large enough to make a good picture. The average camera does not allow for approaching closer than five or six feet, which is all right for large shrubs and similar subjects but would not do for individual, smaller flowers. For such cameras closer pictures require the use of a supplementary lens known as a portrait attachment. These can be purchased very cheaply and permit an approach to within about 2½ feet of the subject. Or with a little experimentation ordinary spectacle lenses can be successfully used. To try them out remove the back of the camera and place a piece of ordinary ground glass where the film goes with the ground side facing the lens, and observe the image. This image will appear upside down, which is quite natural, so don't let it disturb you. Then just mark your distance on the bed of the camera.

Tripod Improvised of Twigs

There are expensive cameras, of course, which are excellent for photography of this nature but which may be prohibitive in price. These have long bellows extensions and allow of approaching to within several inches of the

subject; and having a ground glass as part of the equipment permit studying the image before snapping it.

Tripod

Another important piece of equipment is a tripod or stand of some sort upon which the camera is set when preparing and snapping the picture. A cheap telescoping metal one may be purchased or a free one improvised from three straight branches arranged in much the same way a wigwam or camp fire is set up.

Film

One of the most important factors for obtaining good pictures of flowers is the proper registration of the colors in the flowers. You may have exclaimed more than once over photographs which seemed to make light colors dark and dark colors light and had them in a wrong relationship. Where color is as important as it is in flowers, steps must be taken to correct this.

Film is sensitive to color in varying degrees. As a rule it is very sensitive to blue, which will photograph white or almost white and is not very sensitive to the other end of the spectrum which will photograph much darker than it appears. Yellow, orange and red for instance will photograph a very dark gray or almost black. Green also photographs a very dark shade. This is particularly true in the older types of films and to a lesser degree in the "chrome" types. The newer films, known as panchromatic, correct these color differences to the highest degree. These are known on the market as S. S. pan, panatomic, finopan and other names. They are always wrapped in green paper. The S. S. pan is also a high speed film for bad light conditions. As a further correction for color various "filters" are used. These filters hold back sensitive colors and allow other colors, similar to that of the filter itself, to pass through easily. The most useful color filter is a medium shade of yellow. One may be improvised of cellophane or a pair of yellow sun-glasses, although filters sell quite cheaply. Remember that using a filter usually requires twice the exposure, an increase which may be overcome by using it with the S. S. pan film.

Background

Finally a good piece of equipment to have is a neutral colored cloth to serve as a background. An old window shade will do. This will eliminate any complex and annoying background present in the picture and will help the subject considerably.

Focus

Now we are all set. The first step will be to select the flower we wish to photograph. Push out of the way all grass and flowers which might interfere with the picture. With too many other flowers and plants we will lose the important one in their midst. If the background is complex, set up your own backdrop of cloth or windowshade. If there is a breeze and the flower sways too violently place some obstruction between the wind and flower. Place the camera on its support in such a position that the sun lights the flower favorably. If the sun is too far to one side and part of the flower is too dark, put a piece of white material in such a position that it reflects the sunlight back on the shadow side.

If the camera is the focusing type with a ground glass, simply locate the image on the glass and focus. If the camera is a simple affair place the portrait attachment over the lens and measure the distance to the flower—getting as close as possible. Slip the yellow filter over the lens or the portrait attachment, and make your exposure. Exposure time is variable, dependent on the light conditions, but if the afternoon is clear and sunny your exposure with verichrome film may be about 1/25 of a second at F8 or possibly F11. If the camera is a simple Kodak set the lens opening to its largest size. If the camera has no lens adjustment, it is advisable to use the S. S. pan film and give the usual snap.

General Camera Hints

If your camera has been on the shelf all winter you had better open it up and take out all the dust with a soft brush. Brush the lens too, or use a soft cloth and wipe it gently.

Examine it for pinholes by closing the shutter, placing your eye at the back of the camera, and holding it up to a bright light. The bellows is subject to this defect. Cover the pinholes with an adhesive tape of some sort.

Do not tempt the devil by loading your film in the bright sun. It may blacken the end of your film. A shady spot or interior is safest for this purpose, and do not unroll too much of the protective paper covering.

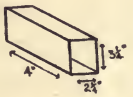
Do not bind yourself to having the sun over the left shoulder when snapping a picture. Very beautiful results are possible with the sun in other positions—on the side or even directly in front if the sun itself is blocked by a cloud or a tree. When facing the sun always shade the lens with your hand or a sunshade.

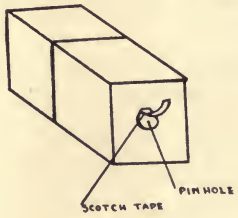
When snapping the shutter do it gently with an even and gradual pressure. Stop breathing for a second if you're holding the camera in your hand; and brace it against your chest.

Remember to adjust your distance scale, if you have one, or your picture will be out of focus and blurred.

And finally read a little bit about the elements of photography. Find out what it really is, why you get a picture, and how it is done. It will improve your pictures and increase your enjoyment considerably.

Pinhole Camera





Fold a piece of cardboard into a tube, open at both ends 2¼" x 3¼" and about 4" long.

Make two cardboard covers, each 2" long and just large enough to slide over the ends of the tube.

In one of these cut a hole about 1" in diameter and paste over this, on the inside, a piece of tin foil with a pinhole in it made with a #10 sewing needle.

Paint the inside black with poster color. Put a piece of scotch tape over the pin-hole for a shutter. Draw lines for the corners of the post to the middle of the back.

To Use—In the darkroom put a piece of cut film in the back cover. Slide the tube on top of it and over that the front end. Set camera up, sight along the lines for your object. Raise the scotch tape for the exposure and press back to end it. On a sunny day you'll need about 15 seconds. Remove film in dark room and develop.

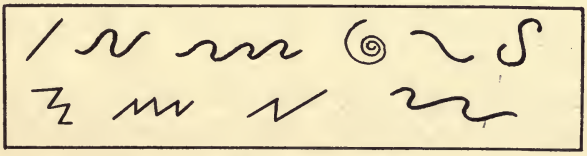
Section II—Nature in Handcraft

NATURE MOTIFS APPLIED TO DESIGN

In creating any sort of design, naturalistic motif or otherwise, it might be well to observe first of all just how nature herself solves the problem of arrangement within a defined area. Observe for instance how nature adapts living forms to meet existing problems—how in a densely wooded area there is an attempt by each individual plant to procure the share of sunlight necessary for its existence. Observe how a small brook follows the natural contour of the earth—water is held within a limited area by definite boundaries. It is possible to select any given area and see how nature fills it; or it is possible to rearrange the component parts according to the demands made by the problem at hand, for, in its final analysis, design is merely the filling in, building up, or arranging the component parts of a given area in a manner that is as pleasing as possible. The actual division of spaces depends altogether upon the student. He may follow whatever artistic tradition he chooses, or he may create an entirely new design without regard to any particular precedent.

Professor Arthur W. Dow, in his very admirable textbook, "Composition," designates the basic elements of design as LINE, MASS, and COLOR. It might be well to keep these elements in mind in applying Nature Motifs to design. LINE refers to boundaries of shapes and the inter-relations of lines and spaces. MASS refers to the combination of light and dark spaces, and COLOR refers to the quality of light.

Rhythm

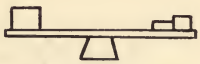


Rhythmic Line

Rhythm, or a feeling of flowing motion, is one of the basic principles and is frequently found in nature. Rhythm is felt in two ways: through a moving line, diagonal, spiral, or curved, or through repetition. We are often exhilarated by the rhythmic line of a tree or branch, just as by a crescendo in music. This same rhythmic motion is felt in the steady beat of the waves

on the shore, or by the repeating beat in music. So in design we may produce rhythm by using a moving line or repeating one or more motifs in a beat-like manner.

Equal Balance (weights)



Unequal Balance (weights)

Bisymmetric Balance (design)

Asymmetric Balance (design)

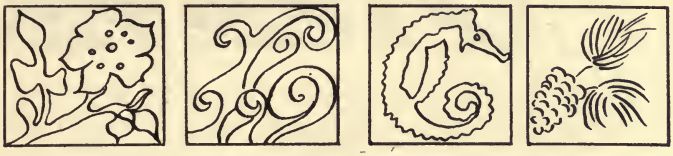
Natural forms usually show perfect BALANCE. Balance may be either equal Bisymmetric or unequal Asymmetric. A perfect balance is essential to stability in nature as it is to composition in Design. Balance in design is best illustrated by comparison with weight. In design the weight is the mass of dark and light.

Now in applying a natural form to design, we must begin to use our imagination, for with all the laws of design in the world, we are lost without that extra touch of originality or imagination. Good design is never merely an exact copy of nature. There is the process of selection, simplification and imagination added. We would then in planning the design, using a natural form, first select the form itself, and two important factors are involved in this choice.

The first consideration is one of *suitability*. If we are planning to use this design motif as an *application* to some constructed object (and we will presume this to be so), we should be sure that the design subject is suitable for that object or in good taste. We may even go further and tie the design motif directly to the use of the object. For instance, a collection case for flower specimens might be decorated with a flower motif and a bird manual with a bird design.

Secondly, we should choose some form with which we are familiar. Our design will be of far better quality if we can actually observe the form to be used than if we have to use a picture. Throughout the entire history of design and ornament we find that artists were strongly influenced by the familiar naturalistic forms surrounding them. These designs were their most successful ones. Egyptian or Assyrian ornament at once suggests the papyrus, the lotus and the palm. Greek artists and decorators relied strongly on the acanthus, the vine, the olive, the ivy; Gothic art made use of the oak, the maple and other leafage; Persian art is replete with the familiar garden

flowers, the pink, the iris, the hyacinth, the rose and the marigold; Japanese art uses the peach and the cherry blossom, the chrysanthemum and the bamboo motif. These plant forms are familiar to these respective countries and civilizations just as roses, lilacs or apple trees are familiar to us.



Rhythmic Line in Natural Forms

Rhythmic Line in Design Motifs

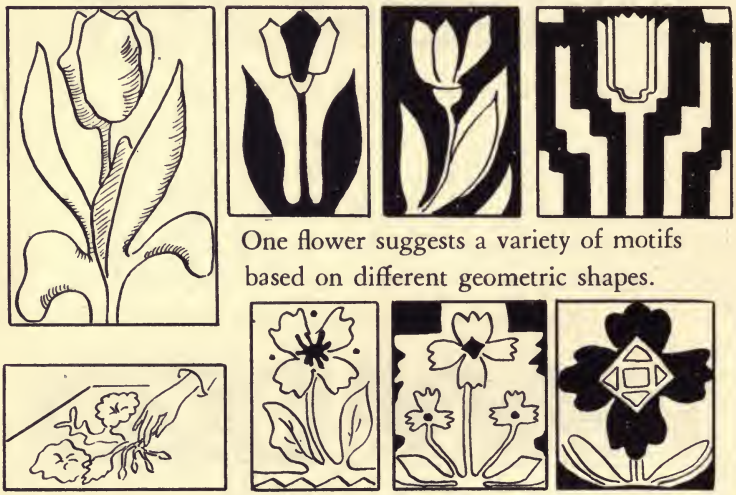
Rhythm Through Repetition in Nature

Rhythm Through Repetition in Design

Emphasizing Through Exaggeration and Refinement

Exaggeration and repetition of the jagged edge of a leaf and simplification of the leaf shaped to a triangle: As soon as we have chosen carefully the form to be used as the basic of our design we should choose the particular point about that form which makes it different from any other. In a

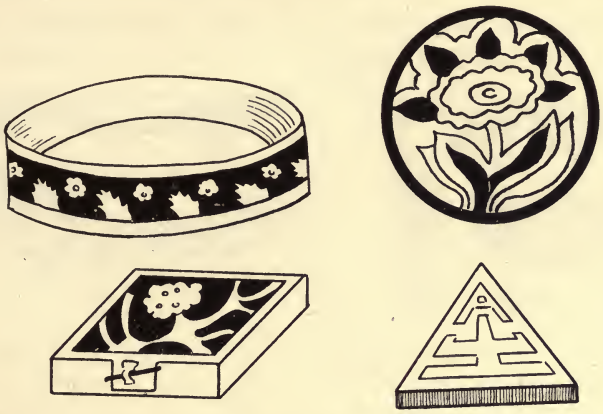
flower it might be an odd petal formation, in a bird a different wing marking. And here we add another design principle which is EMPHASIS. We might define this term simply as exaggeration for effect. We would exaggerate and refine this interesting part of the form to make it the most important part of the design and perhaps repeat that point within the design. Now we are actually beginning to design, for we are adding something of our own imagination.



One flower suggests a variety of motifs based on different geometric shapes.

Then we would begin to analyze a bit more and figure how much of the detail of the actual form we could eliminate in order to emphasize still further and to improve the design through simplification. Just as a poet tells the story of action in the least number of words for a telling effect, so a designer should depict form in the least number of lines and masses for striking design. In good design we find a tendency to veer away from naturalistic representation and to refine form often to symbols or geometric translations of form. This use of squares, circles, triangles and oblongs as a means of simplification is an excellent way of building up design with children as it is simple and affords variety. To illustrate: a leaf form might take an oblong form or an oval form; a flower petal a circular

form or a triangular form. In fact one flower used as inspiration might be developed into hundreds of different design motifs through this method of emphasizing an outstanding point and using geometric forms for variety.



A design must fit the area into which it is to be placed.

It is a generally accepted principle in decoration that an ornament should harmonize with the form and structure of the object which it adorns, should be in complete subordination to it, should never stifle or conceal it. In other words, Structural Design, or the form of the object, comes before Applied Design, or the ornamentation of an object. There are generally rather obvious spots for applied design; as, a box top and sides; the cover of a book, or the handle of a spoon. We would apply the design to the portion of the object where it would best enrich the object. Again, simplicity is the keynote of good design. An unadorned object is better than an over-rated one. As soon as we limit ourselves to a definite area we should realize that the size and shape of this area is an essential part of our design. The same motif may be worked into any number of forms but the design must not appear forced into the area.

Since we are planning a design that is to be applied to some concrete object, we must consider another problem which might be called Limitations of Material. There are for instance certain things we can or cannot do with a chip carving knife, and limitations in the use of wood as a craft medium. There is therefore a definite technique in chip carving that should be considered in making the design. The triangular cuts characteristic of this craft would be shown as part of the design.

The same rule applies to textile printing. In printing with linoleum we

come across the problem of cutting or gouging away parts of the linoleum. Any detail must be made in the cut away part. Therefore the design for the linoleum print would show only white line detail and strong masses of dark. A line drawing would be entirely unsatisfactory. In designing for Leathercraft, however, a line drawing is essential, as this technique involves low relief with a finely tooled edge line.

A linoleum block design must show strong contrast in dark and light; with more dark area than light.

A leathercraft design should be in line, with a suggestion of strippling for the depressed areas if desired.

With these points in mind and a little practice, it should not be difficult to develop any number of interesting design motifs from natural forms—A simple outline of the preceding points may be of help.

Steps in Planning Design:

I. Decide upon the object to receive the Applied Design.
II. Choose a suitable subject for the design.
III. Study the subject and make several sketches, considering:—
    A. Rhythm through line and repetition.
    B. Balance.
    C. Emphasis through exaggeration and simplification.
IV. Refine the design for application through:—
    A. Consideration of the size and shape of the area to be decorated.
    B. The tools to be used in applying the design.
    C. The material of the object to be decorated.

NATURE NOTEBOOKS

Every nature student should have a good notebook in which to make permanent notes on observations, mount clippings and photographs, record nature poems, etc. If the book is made attractive and convenient, it urges its owner constantly for new materials to be mounted on its pages.

Three-ply wood of any kind probably makes the best covers since it will not warp. And it is easy to cut through one ply for the construction and decorating purposes. Bass wood may also be used if it is to be decorated with a chip carved design or carved with a chisel.

Small Notebook

Since this book is to be small enough to fit into a pocket, 3″ x 4″ is a convenient size. The cover should be made of wood or a material that will not bend, such as cardboard or cork, in order to make it firm enough to carry loose leaves.

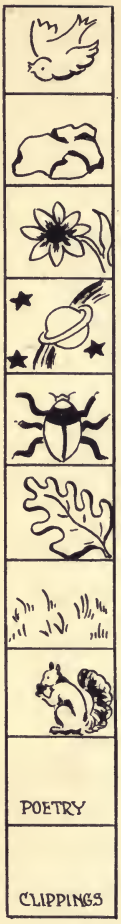
An attractive cover may also be made by staining it with a walnut or mahogany stain and applique a design cut from scrap leather. Since leather comes in all colors it is possible to cut out a flower, leaf, fruit, or other nature motifs.

Construction

On the left side of the top cover draw a line a little over ¼″ wide from the edge and cut along with a knife. If the cover is made of three-ply wood, chip off one ply along the narrow strip to make a depression for the back of the cover. If bass wood is used, cut away about 1/16 of an inch. Take the back cover, draw a line down the right hand side of it and again cut away the narrow strip. You will then be ready to fasten the cover together.

Cut a piece of leather the length of the book and twice the width of one of the narrow strips you have chipped off, plus about ¼ of an inch to allow for the leaves. Nail it on to the two covers with small tacks or upholstery nails.

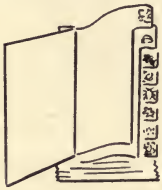
Since the book is to be carried in the field for observation notes, the filler can be made of loose leaves that may be filed away or destroyed after the information has been recorded in the permanent notebook. The pages are held in place by tying a leather thong or a piece of tape around the back and inserting the pages under it. Each page should be labeled—one for birds, one for trees, flowers, etc., as shown in diagram B.



INDEX FOR NATURE BOOK

Large Notebook

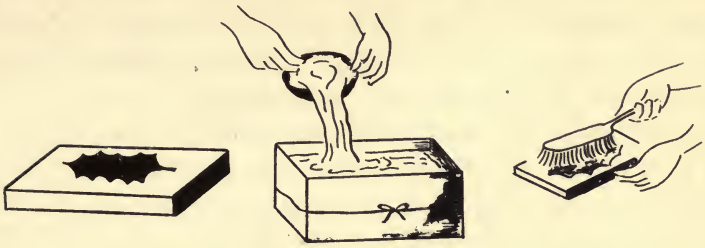
This book can be made in various sizes, but 9″ x 12″ is perhaps the most convenient, as typewriting paper can be used as a filler to brighten up the book and make an interesting index. The paper should be sorted into light and dark shades with the light pieces placed in the front of the book for writing purposes and the dark in the back for mounting the clippings and photographs, specimens, etc.



Construction: The book pictured above is made of three ply wood on ¼″ bass wood. The piece of wood that forms the back of the cover is made of a solid piece while the top cover has a strip about 2½″ wide cut off of the left hand side to be used for binding the book together. The large piece is then attached by nailing two small pieces of leather at the top and bottom to act as hinges. Four holes are bored in the small piece of the top cover, and four more in the back cover on the right hand side. Be sure to space them exactly the same as on the top; so that the book can be laced together with a piece of leather. (Diagram A) Cut the leather a little wider than the holes so it fits tightly and will not have to be laced as shown in the picture. The book may be decorated in various ways. One suggestion is to give it three or four coats of shellac and rub it down each time with steel wool. Cut-out letters of leather or cork may be glued on with rubber cement, or a nature design may be cut from scraps of leather and fastened on in the same way. When the book is completed, rub it thoroughly with wax to eliminate the gloss.

Index: The diagram above at left is a suggested index for the large nature notebook. If you are using colored construction paper as a filler, use the darkest colors for the title pages and cut a ½″ strip from the right hand side of the paper to form the index. Cut the pages so that the indentation is 1″ shorter on each one so they will form an index when they are fitted together.

PLASTER CASTS FROM MUD PIES



Preparing plaster casts of leaves and fruits long has been a favorite out-of-doors craft. Here is a way to make them with mud pies instead of plasteline. Mix some fine earth with water until it forms a thick paste and knead it with your hands until it is the consistency of plasteline. Form it into a cake one inch thick and the size of the desired plaque. Let it stand about ten minutes until the top dries somewhat and then press whatever object you want to cast into the top—just hard enough to make an imprint. (Diagram A) If leaves are used be sure the vein side is next to the mud cake. Seed pods or buds of trees make especially attractive plaques.

Next cut a strip of cardboard about three inches wide and long enough to go around the cake of mud, and tie a string around it. (Diagram B) You are now ready to mix the Plaster of Paris. Pour the powdered plaster into an old container and add enough water to make it the consistency of heavy cream being careful to stir it continuously. Pour it into the mold and allow it to stand until thoroughly hardened. Take off cardboard and break off the mud cake and polish the surface with an old brush. The small particles of mud that adhere to the plaque are rubbed into the plaster giving it the effect of old ivory.

MODELING YOUR PET

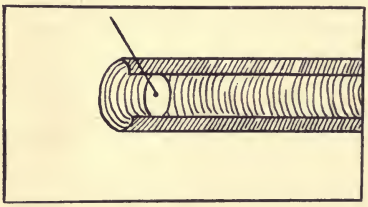
There are several ways of modeling pets or animals. Such a project is an excellent way to make a study of animals. When a child begins to make a

model of an animal, there is always a question about where the ears should fit on the head, how long the tail should be in proportion to the rest of the body, where the eyes should go, etc. An entire group might enjoy making a model of its pet and having a "Pet Show" afterwards. Award a blue ribbon to the winner just to add to the spirit of the occasion.

Clay would be the ideal medium for the model as some children might like to have it fired and glazed if they have a particularly good model. Plasteline may also be used if you are making temporary models. Just mud also serves the purpose, especially if you can find earth that has the quality of clay.

A PINHOLE TELESCOPE

To make a pinhole telescope get a pasteboard tube about 1¼" in diameter and 5 or 6 inches long. A paper tube for mailing papers is just the thing and can be bought at any stationery store. Cut a disk or circular piece of cardboard just large enough to fit the tube, and push a pin point or needle through the center to make a small, clean hole. Next, glue this cardboard disk in the tube ½" from one end.



This disk must be glued in the tube so that no light can leak around the edge.

Though it does not magnify the image of the object that is seen through it, it aids the naked eye because it blocks out everything surrounding it.

BAROMETER

Perhaps you have seen in stores barometers which resemble a plaque or a picture, but on which is a piece of blotting paper or a piece of cloth. In dry weather the blotter will be blue. When the air becomes moist, it will be

lavender and thus forecast a change. When it is red rain or storm is indicated.

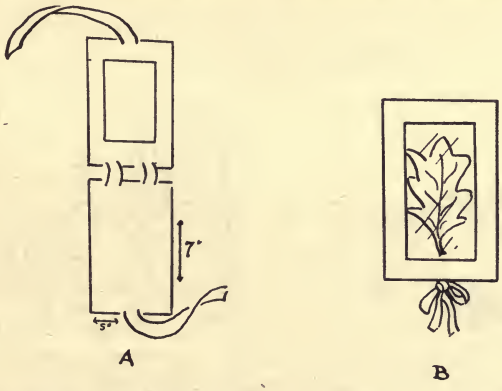
To prepare: Dip white blotting paper, which has been cut into small pieces, in the following solution:

4 oz. water
1 oz. chloride of cobalt
½ oz. common salt
75 grains calcium chloride
¼ oz. gum arabic

Be sure to tell your chemist not to make it chemically pure, otherwise he will make an extra charge. The above formula should make about 50 barometers.

As soon as the pieces of blotting paper are thoroughly dry, set the imaginations of your children to work. Cut out objects from colored paper, being sure to include something cut from the blotting paper in your design. Paste them on to a piece of wood or cardboard for a background and attach a string or ring to the back so they can be hung on the wall.

CARDBOARD PRINTING FRAME



A B

The following is an inexpensive printing frame that can be constructed from materials found at camp. It is used for making Van Dyke, ozalid, or blue prints.

Direction for Making: Cut four pieces of cardboard to the size frame desired—one with a 5" x 7" opening is a good size. Also cut two pieces of ¾" cloth tape four inches in length which will be used later for hinges and two other pieces 8" in length to be used as ties. Take two pieces of cardboard and cut out center leaving an inch and a half margin all around to be

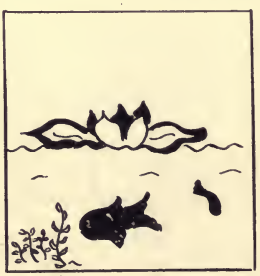
used as the top of the frame. The two remaining pieces of cardboard will form the bottom of the frame. Cover one of these with library paste or glue. At one end place the ends of the short pieces of tape so that about 1½" remain in the paste and in the middle of the opposite end place end of one of the long pieces of tape which will be used for one of the ties. (Diagram A) Cover whole with other piece of cardboard and place under weight until it dries.

Now take the two top pieces from which the center has been cut and cover one piece with paste. Place the bottom piece which is already pasted together with the short pieces of tape close to one end of the top so that the free ends of the two small pieces of tape can be pressed into the paste to form the hinges. Be sure to leave enough tape on the other end for a tie. Cut a piece of cellophane about 2" larger than the opening and place it in the paste over the opening being careful there are no wrinkles. (Diagram B) Now put on the other piece of cardboard and place a weight on top.

The cellophane will look more like glass if water is applied carefully with a wet rag and allowed to dry after the frame is finished. It shrinks in drying thus eliminating the creases.

The frame is much more attractive if it is painted when completed.

NATURE PRINTS



Nature prints make attractive nature books, especially since they can be done in bright colors. Children who have to visit the city parks or restricted camp areas for their specimen depend almost entirely on them for their natural collections. They are inexpensive, and can be made into colorful notebooks by a large group.

The prints will be more attractive if care is taken with their composition, or they may become even more creative in design if cut-outs or silhouettes are used. For instance it is easy to make a print of a flower in its natural setting by cutting objects that surround it from paper and placing them on

the printing frame before the exposure is made. A water lily is much more realistic if it is placed at the top of the print and zigzag line cut from paper placed just under to represent water, a silhouette of a fish or frog might be added underneath. (Diagram A) Tissue paper, when printed, gives the effect of shadows and is good for portraying dwarfs or fairies who live in a fantastic world. Cut-outs of bugs or beetles add a realistic setting and may become saucy by wearing a high hat and carrying a cane!

A single flower or leaf may be used to make twenty or more prints thus serving the whole group. For this reason they become an object lesson in flower conservation which our cities and states are trying so hard to teach to the children. It is a decided advantage to have a completed record made of nature specimens as soon as they are gathered, otherwise the children lose them or they wither before the next day. The crayon prints described on another page are probably the best for leaves as they show even the smallest veins. Prints of flowers, grasses or moss are most successfully made from the blue print or Van Dyke paper.

Instructions for the Use of Van Dyke Paper

Materials Needed: printing frames; two vessels of water; Van Dyke paper.

1. Proper exposure can be obtained only by making tests and observing carefully the length of time consumed in each operation until a rich brown, almost black, color is produced after the washing and drying process. This is due to the fact that the strength of the sunlight and weather conditions will cause to vary the length of exposure required.

2. After proper exposure is made, do not allow the prints to remain in sunlight or any other bright light until after they are developed. If possible to avoid this, do not handle the undeveloped print with wet hands. The prints should be washed thoroughly in a bath of plain water which should be kept in motion during the washing process. Do not allow the prints to lie and soak in undisturbed water.

3. The next step is a bath in a fixing solution in which is used Van Dyke Salts or hypo-sulphite of soda which can be obtained from any camera or photo supply house or at most drug stores. This should be made in a proportion of approximately one ounce to a gallon of water or a handful in about two gallons of water, and should be allowed to dissolve before using. The prints should be left in the bath for about two minutes, or long enough to cause it to assume a reddish brown color.

4. It should then be washed thoroughly again in a bath of plain water, preferably running water, until it is safe to assume that none of the fixing solution remains on the paper.

5. Dry thoroughly in strong light.

If you follow the foregoing instructions carefully, you should obtain satisfactory prints. Be sure to cut paper in a dark room and place in an envelope. Be sure to place side to be exposed down so it has less chance of being exposed to the light. Place nature specimen on glass or top of frame. Pull out a piece of Van Dyke paper, being sure the face is down and place it in the frame with side to be exposed next to the glass.

Blue Prints

Blue prints of leaves, grasses and flowers have long been a favorite craft for use in camps and play grounds. This is because they are inexpensive, attractive in a notebook, and the paper may be bought in practically any city. It is also possible to teach blue printing to a fairly large group of children at one time providing there are several printing frames available and the water in the containers can be changed frequently. If silhouettes are to be used, they should be drawn and cut out ahead of time, also small squares of paper should be cut for placing in the lower left hand corner of the print to be used for labels when they are mounted. (See Diagram)

Blue print paper may be obtained at any draftsmen's supply shop or large stationery store. It usually comes in a roll 36″ wide and must be cut in a dark room, or at night, into the desired size pieces. It is much better to have the store cut them and pay a little extra for their trouble. Blue print paper cut 5″ x 7″ is usually the best size, as it will fit into most notebooks and will cover the common leaves and flowers. It is best to place the face side of the paper all the same way and mark "top" and "bottom" on the outside of the package. Keep the bottom side up, so you can pull the sheets out one at a time with the face side down and put it in the frame immediately and it is not exposed to the light any more than is necessary.

How to print: Place the leaf, flower or whatever nature specimen is to be printed on the glass part of the frame. Also any paper cut-outs that are to

be in the picture. Now take a piece of blue print paper from the package, making sure you take it out with the face side down, and place it in the frame with the blue side next to the glass. Tie the frame together and turn it over and expose it to the sun. Leave it exposed until the paper turns deep blue—30 or 60 seconds is about right on a bright summer day. Remove the paper and wash it thoroughly in cold water. Place it in rinse water, or running water if you have it. After the print is washed thoroughly, place it between newspapers to dry.

Variations: 1. The prints may be colored with crayons or water colors, using the fresh flower or leaf as a guide. Leaf prints are much more valuable in a collection if the veins can be drawn in with crayons or ink.

2. Small stars glued on the glass in the form of constellations make attractive star charts for nature notebooks. They can be cut out of paper with a conductor's paper punch.

3. Blue prints of flowers, grass or ferns make attractive greeting cards or place cards for camp. They also may be cut in small squares and used for decorating stationery or book marks.

4. Lay a piece of screen on the plant and the paper on top and expose it to the light. This will give the print a checkered background.

5. Place photographic negatives in the frame and expose to the light. The print will come out blue and white instead of black and white.

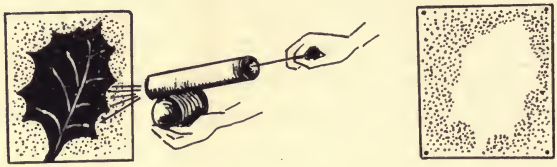
6. Large prints may be used for screens or panels and for decorating cabins and troop houses.

Invitations and Greeting Cards

Very attractive invitations and greeting cards can be made from blueprint paper for flower shows, nature plays, campfire programs, etc. Use miniature leaves, flowers or ferns for the designs and place small figures cut as silhouettes around them, remembering to keep the theme in accordance with the occasion. If you want writing or printing to be included in the design, either write the words on the top of the glass in the printing frame

with black asphaltum paint, or cut a piece of black paper and cover the area while printing. After the print is exposed, the paper is removed and the result will be a white area on which can be written with ink or crayons. The invitations will be more durable if they are mounted on construction paper.

Spatter Prints



Spatter prints are made by pinning a leaf or a plant to whatever is to be used for a background and spattering the surface around it with ink or enamel. Dye is used for muslin or other cloth materials.

Method

Several methods may be used for spattering the background. The one most commonly used is the one where a stiff brush is dipped in paint and rubbed over a piece of screen that is held a few inches above the plant, thus spattering it as the brush is rubbed back and forth across it. A much quicker method, however, is to spatter the background by means of a Flit gun (spray gun) that may be purchased at any ten cent store.

Pin the leaves or flowers securely to the background that is to be spattered and spray with the Flit gun, being careful to keep the spray uniform. Enamel is the most economical medium to use for spraying on paper or cardboard. If it is too thick to use in the Flit gun, thin it with turpentine. A good grade of enamel can be used with one-third turpentine.

Suggestions: 1. If a large group is making prints, an easy way to get varied effects is to buy a package of construction paper in assorted colors and spray them all with white enamel. It is more economical to have the leaf itself in different colors than to buy different colors of enamels or ink to spray the background.

2. Effective screens may be made by covering the frame with wrapping paper, then pinning leaves, flowers, and even cut-outs of butterflies or animals on the background in a design. Spatter the background with a color to harmonize with the rest of the room.

3. Woodsy costumes may be made by pinning leaves on bright cambric muslin and spraying with solution of dark brown sunset dye. Other colors

may be used if you prefer. The dark background tones down the color and gives a definite pattern. Patterns cut from paper may be used instead of plants.

4. Outdoor tables for picnics can be decorated by covering them with either wrapping paper or white paper and pinning ferns, leaves, and flowers so they form a design and spattering a background with color. A large design in the middle of the table may be used for a center piece and a small fern in front of each plate makes a good place card.

5. The leaf or flower on a spatter print can be colored with crayon or water colors, using the living specimen as a guide to the colors.

Crayon Leaf Prints

Nearly everyone, one time or another, has played with money made by placing a penny or a nickel under a piece of paper and rubbing a lead pencil back and forth over it. A picture of the coin appears on the paper. It is then cut out to eliminate the marks that have gone past the coin and pasted on a piece of cardboard, or another piece of paper. This same principle is used in the making of crayon prints of leaves.

Place the leaf you wish to print on a table with vein side up, and cover it with a piece of typewriting paper. Rub over the surface with a green crayon and an exact picture of the leaf will appear on the paper, showing even the smallest veins. Cut the leaf out carefully with scissors and mount on a sheet of paper or a leaf in your notebook.

Crayon prints are probably the most satisfactory ones for keeping a record of leaves as they show all their veins and indentations. It is possible to gather leaves from twenty-five different trees or shrubs while on a hike and make the crayon prints all in one day. They may be cut and mounted at some future time. Especially beautiful ones can be made in the fall by using different colors of crayons and copying the autumn colors. Such prints, when cut out, make effective decorations for cabins, museums, or school rooms when used as a frieze around the room, or mounted on windows.

Shadow Prints

Shadow prints are made by holding a leaf or a flower between a lighted candle and a piece of paper. If held in the right position, the light will cast a shadow of the plant on the paper which can easily be traced around with a pencil. You now have a pattern of the plant. Cut around the outline and mount on paper of another color. If you are making a print of a flower, you may use two colors of paper, one for the flower, and green for the leaves. If you do this, make your first sketch on plain paper, then use it as a pattern.

Section III—Nature in Games

NATURE JACKSTRAWS

JACKSTRAWS ORIGINATED IN the southern part of France among the charcoal-makers of the forests. Chips of wood or strips of charcoal were used in playing the game. The combination of the steady hand, keen eye, etc., caused it to receive popular approval, which it still has, and elaborate variations of the game have been invented. In one variation the French people gave the different pieces names; i.e., King, Queen, Knight. The king being twenty points, the Queen fifteen, the Knight ten, and so on.

In England the game is called Spillikins, and even today it is again popular universally under new names. 4-5-6- is a new name for this old game, but it's still jackstraws.

Nature Jackstraws is played by any number of players and as a solitaire. The jackstraws are of various kinds of wood with differently shaped ends held in a sheaf. Then the hand holding the sheaf is rested on the table and the grip on the sheaf quickly released. The object of the game is to procure from the pile a stick of wood without moving or touching any of the other sticks. The player must also give the name of the kind of wood in his stick. He continues to play until he touches or moves another stick.

PIERROT TOP

A six-sided top can be made of a piece of wood or branch of tree about two inches by two inches by two inches and one half long. Use a plane or

knife to cut out a piece of wood to this size. Make it a six-sided figure. It can be a bit larger or smaller as one chooses. At about two-thirds of the way from the top of the long side, draw a line on all six sides. Cut away the wood on the bottom third so as to form a point towards the very bottom center. This would give you a spinner or top without a handle. Glue one eight inch dowel one and one-half inches long into a hole bored in the top center for this purpose. Place the name or picture of a subject on each side of the top. Your top is ready to play with.

One player spins the top. If it stops at trees, that player will have to answer three questions with reference to trees. The leader will ask the questions taken from a pre-arranged list. Missing any of the three would require a forfeit of some sort. There are various methods of regaining forfeits. Use any of them.

The top may have pictures of bird, fish, leaf, stone, flower, fruit, vegetable, tree, or any other subject pertaining to nature.

BIRD FLIGHT

This game is designed primarily for the study of the color and size of nature birds. Choose the bird you prefer to make and draw an outline as though you were looking at it from above with its wings stretched wide. Now fold the paper so the fold is on the side of the body of the bird and cut it out so that each wing of the bird is exactly the same size when it is unfolded. Use this for your pattern and trace around it on cardboard and cut out. Brace it underneath with a few sticks of light wood by gluing the braces to the cardboard. There should be braces across the wings and from bill to tail. Leave a small notch in the brace running from bill to tail about half way down the stick.

Choose any twig that will bend a little without breaking and use about two feet of it as a propeller. This is done by tying a string eight inches long to the twig and leave a loop one inch long at the loose end.

You are now ready to put your bird in flight. The bird will look like a monoplane colored as near the color of the bird as possible. Hook the notch in the bird brace to the loop in string. Pull the bird with the right hand far back and hold the twig firmly in the left. The twig will bend and upon releasing the bird with the right hand will take flight in the direction it is pointed.

Many rules may be used for this game. One might consist in a group of contestants racing a number of birds across a field as fast as possible with a minimum number of starts and stops. Another variation might be to identify the plant on which the bird lights. The game should be limited to the birds that are native to that part of the country.

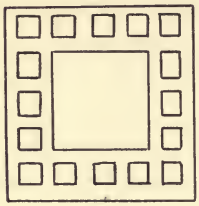
BALL AND REED GAME

Find a stick about 12″ long and 1″ in diameter filled with a soft pitch so that it can be easily removed. An Elder stem or a piece of bamboo would be good. After it is hollowed out take two small rubber balls slightly larger than the two ends and tie a piece of string to one ball. Now thread the string through the hollow stick and tie it to the other ball. The game is now constructed. To play throw it on the ground and if it is thrown a certain way it will bounce back to the player. It can also be thrown so it will bounce in the opposite direction. Practice throwing and make up your own game. Placing a number of nature objects on the floor and trying to hit them and then naming them is one suggestion.

CORNCOB DART GAME

Dart games are always fun but must be played under careful supervision, so that no one is injured from the dart. An excellent dart may be made by cutting a corncob in two and using one piece for the body of the dart. Take three feathers about as long as the cob and stick them in the top at equal distances apart as shown in the diagram. Arrange them so the curved part of the feathers are on the inside. This will make the dart whirl as it goes through the air. Stick a large needle in the other end of the cob

by covering the eye with glue and forcing it in one-third the length of the needle.



Make the dart board of soft wood, or cover it with several layers of cardboard so the dart will stick after it is thrown. Vary the object of the game as often as possible. The one pictured in the diagram suggests a corn field with all the plants that grow around it. The players try to hit the squares and name the plants if possible.

NATURE ARCHES

Construct the game by cutting five twigs ¾ inch in diameter and fifteen inches long. Make a series of semi-circles by sticking both ends of the twigs in the ground so as to make an 8″ radius and leave not more than two inches between each semi-circle. The object of the game is to throw or roll pine cones, apples or rocks through the holes from a distance of ten feet or more.

On the top of the holes place labels representing the different nature fields you are studying and then make up your own rules. You may charge forfeits by asking questions if they miss the holes, or place objects back of the holes and give points if they hit one and can name it.

This game may also be used indoors by adapting it to a board game. Cut five semi-circles with an eight inch radius out of a board twelve inches high and cut it so there is a one inch space between each hole. There should be about one and a half inch line along the top of the board on which to pin labels. Prop the board up at one end of the room and apply the same rules.

NATURE SKIDDLES

The game of skiddles dates back to Scotland—and many games have been adapted from it, such as nine pins and bowling. It was a game in

which a strong arm and accurate eye was necessary. If you want to use the same idea for a nature game, cut five sticks about two inches in diameter and five inches high. Take four of the sticks and stand them on end so as to form a fifteen inch square and place the fifth piece in the center. From a distance of fifteen feet, throw a fifteen inch length of the same type of wood so as to knock down as many of the five short pieces as possible. Three throws are permitted.

If the player succeeds in throwing down five pieces in one throw, no questions need be answered as a forfeit. If it takes two throws to knock down five pieces two questions must be answered. If three throws, three questions must be answered. If any pieces remain standing after three tries, five questions would have to be answered. The leader could have a prepared list of questions which could be asked in turn. The questions would all refer to some nature study. Answering incorrectly would penalize the player one point for each mistake. The player is eliminated when ten points are scored against him.

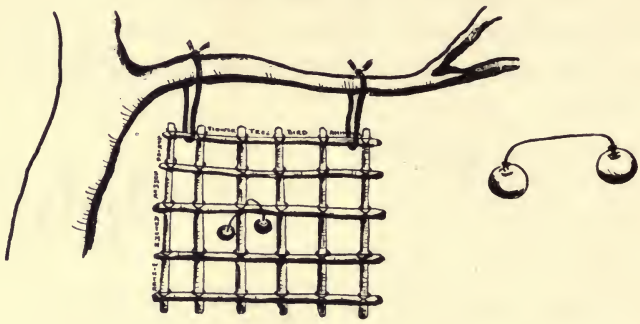
HANDKERCHIEF SLING

This game is especially appropriate for playing on a hike as each hiker usually has a bandanna as part of his equipment and rocks can always be found long the trail.

Place a rock two inches in diameter on one corner of the bandanna, then fold the edges over and tie a knot so the rock will be held in place. To play hold the bandanna by the corner opposite from which the stone is tied and swing it around above your head and throw it. The rules of the game may be varied. You can throw at a definite object and tell something about it if

you hit it, or you may throw it by chance and name the plant on which it lights.

TREE GRAPH



This game is educational as well as recreational. Cut twelve or fourteen straight sticks about one inch in diameter and six feet long. Lash the sticks together as shown in the diagram so that they form equal squares as in a net. When it is completed suspend it from a tree by tying it to a lower limb, or tie it between two trees. It should be hung three or four feet above the ground.

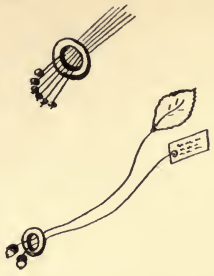
The second part of the construction is the tying together of two balls small enough to go through the openings between the twigs with a string approximately four inches long between them. Two green apples will serve equally well, or two pieces of wood whittled into the shape of a ball.

From a designated distance throw the balls attached to the string in the direction of the netted square. The balls will go through two holes and the string between them will keep them dangling on the opposite side so it can be determined which holes the balls passed through.

The object of the game may be varied from day to day. One suggestion is to print the names of the four seasons along one side and the words—tree, flower, bird, animal and star across the top. One ball would represent the season and the other a tree, flower, or bird that is found during that season of the year. Instead of four seasons on the side, change it sometimes to woods, water, and meadow and tell what nature objects can be found in each place.

STRING GAME

This game consists of as many strings as there are players. Each string should be four or five yards long, with an acorn or a bead tied on to one end and a note or a silhouette of some nature object on the other. On this is

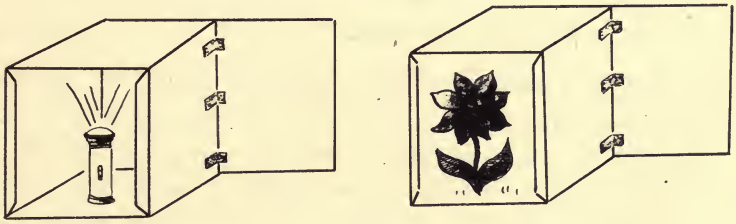


written a question for the players to study. The leader gives the ends of the string to which the questions are tied to each of the players who stand in a semi-circle, threads them through a large ring and holds the other ends in one hand. If they are held tightly it is impossible to identify the ends with with the players. The object of the game is to pull the strings by chance and have the players answer the questions.

Section IV—Nature in Dramatics

There is no better way to introduce nature to others and to make them interested than to dramatize it in some way. The campfire is a good place to tell about adventures you have had on a nature hike, either by means of shadow puppets, pantomime or short plays written by the children themselves. Nature themes have long been the favorite ones for Scouts' Own or Sunday programs. It is important that all your nature programs are not serious ones, otherwise the audience will get the impression that there is no fun in nature. Make them adventurous, humorous and at the same time educational.

LANTERN SLIDES

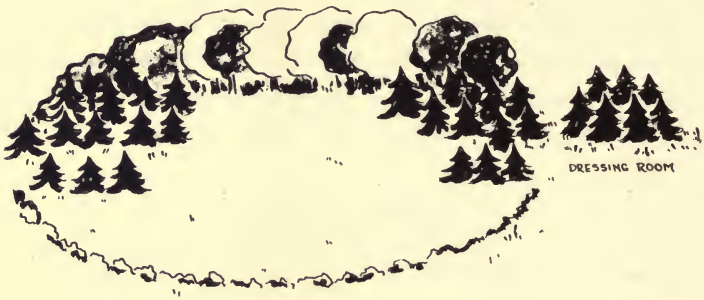


Take a paste board cooky box and remove the top. Some boxes have the four sides turned in toward the center about a half inch, if so, remove two of the folds on opposite ends. The two remaining folds will hold the lantern slide in place. (See Diagram) If the edges are not folded, cut the corners down a half inch from the top and bend the two side ones in toward the center removing the other two strips. Cut around three sides of the bottom to form a door at the back. The box is set on its side while in use with the top toward the audience and the back toward the manipulator. Place the box up high if the audience is large.

Cut pieces of cardboard the same size as the opening of the box for the making of the lantern slides. Draw an outline of the leaf, bird or flower that you wish to show on the slide and cut around it with a sharp knife after the inside is removed. Use it as a pattern for cutting out the crepe paper to cover the hole in the slide, only remember to cut the paper an inch larger for pasting purposes. Copy the colors of whatever plant or bird you are using on the slide by cutting out different colors of crepe and pasting them in the proper place. Colored transparent paper may also be used and cellophane if it is put on in two layers. Star constellations are effective if stars are cut out and yellow paper is pasted on the back.

The lantern slides are used by placing a flashlight in the box and slipping one of the lantern slides down over the top. Of course they must be used after dark. Have someone read a poem about each slide as it is shown, tell a story, or perhaps you may know an appropriate song.

A NATURE THEATER



The building of a natural theater out-of-doors would be an excellent project for a nature group and any camp or play ground would welcome such a contribution. If possible, select a level piece of ground for the stage that has a slight slope at one side for the seating of the audience. The diagram above suggests a possible arrangement of the trees and shrubs, but the person in charge of dramatics should be consulted for further suggestions. Consult your tree books and decide which trees and shrubs would serve best for the different purposes. If you can find a spot with large trees for the background it would be possible to transplant the other, thus completing the stage in one season. Small spruce trees or any kind of pine make good wings and they should be planted about six feet apart to allow for their growth. Very low shrubs should be planted at the front of the stage to show the audience just where the stage begins so they can seat themselves accordingly. The small shrubs would also cover any footlights that are needed in the production.

A dressing room might also be constructed back of the stage by planting pine trees very close together in the shape of a room, leaving a small opening for a door. It can also be made by building a trellis and covering it with vines.

You might extend the project by building seats for the audience. Several small sticks lashed together make good individual seats, or a series of logs laid in rows can be used. Simpler seats, however, can be made by sawing cross sections of a log about 18 inches in diameter into pieces about one inch thick and placed around for individual seats.

The center of the stage should be covered with grass in which there are no stones or sticks so that the players can perform in their bare feet. If the plot is not already covered with grass it can be sodded by getting the grass elsewhere. Consult a landscape gardener and find out how to do it.

PUPPET SHOWS

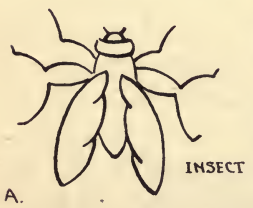
Insect Puppets

No puppet show is more appropriate for the out-of-doors than one that has insects for its characters, especially if a hornet or a mosquito can be included! The show, of course, is intended to be educational as well as entertaining and the stage should be placed in a central place where groups like to congregate.

The puppets themselves are small and are best used by children to tell their friends new facts they have discovered about insects. Think how exciting it would be for a group to observe an ant hill or overturn a rock where the insects have hidden, then write the story and present it to its friends! Themes such as "How the Katy-Dids Sing," or "Ants and Their Cows" are excellent for plays and the children like to write them themselves. Decoration of the stage and the making of the scenery also becomes a part of their education as the insects should be shown in their natural setting and feed on the plants on which they are found.

The puppets described are made of plastic wood and are intended for permanent use where a group is interested in completing a whole family of insects. Temporary ones can be made from mud or paper mash, if they are to be used on only one or two occasions. Effective ones can also be done by using dried fruits such as prunes and apricots, making the legs and antennae of pipe cleaners.

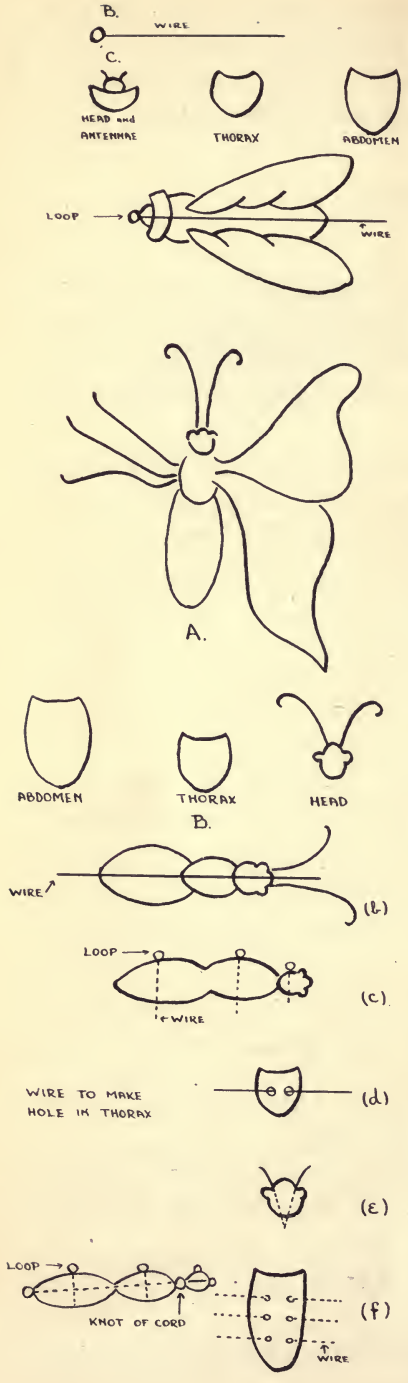
Directions for Making the Puppets



Material: 1. Wire; 2. Pipe cleaners; 3. Plastic wood; 4. Possibly oiled silk.

Construction: A. First draw the pattern of the insect you wish to model. Note that most insects are divided into three sections:

1. Head which contains eyes, mouth and antennae.
2. Thorax, the part containing the legs (always 3 pairs) and the wings.
3. The abdomen—(no appendages).



B. Take a piece of wire and make a small loop on one end.

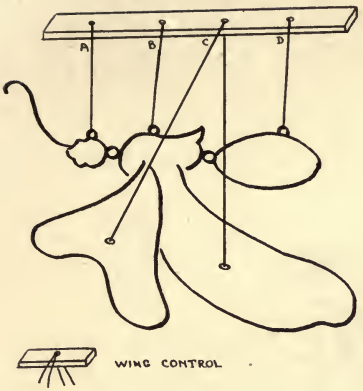
C. Take some plastic wood and model the different parts of the insects. Insert the wire through them (as in Figure 3).

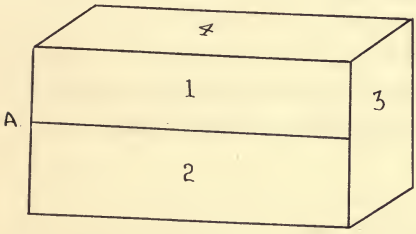
When the plastic wood is a little hard but not dry, take a pipe cleaner and burn off the fussy part of it so that it leaves a twisted wire. Insert the wires in the thorax, making sure that you have three pairs. Prepare and attach the antennae in the same way. When the insect is dry, take some oil silk or oiled paper (provided the insect has wings), cut it in the shape of the wings and glue them on the thorax. The insect is ready for painting.

The Marionette Insects

A. Construction: Draw diagram of insect to be made.

B. Take plastic wood, model the head, thorax and abdomen. When nearly dry, push a wire through each, from head to tail. Then push another wire through the under part of each section and up through the back. (B/b) Make a small loop in each wire as shown in B/c. Bore two holes in the head as shown B/e. Through this will pass twisted wire obtained by burning the fuzzy part of a pipe cleaner, and making the antennae. Through the under part of the thorax make three holes with a wire and then pass the twisted wire through. This will be for the legs. Then let the plastic wood dry.

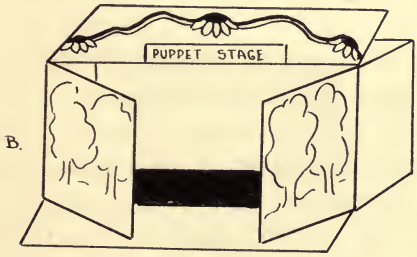


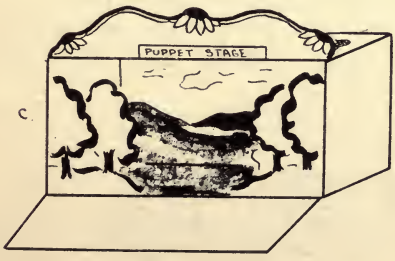


C. Make the wings by shaping them in wire. There will be four wings: two front, and two back. Take some oil silk and wire, wrapping is under the wire and gluing it there. When this dries, cut it around with a scissors, leaving about ¼" edge around the wire. Then baste it with a needle and thread. When you have completed both sets attach them with a piece of wire as shown at C/c through the hole in the top part of the thorax. CB/d

Remove the wire that goes through the head, thorax, and abdomen and replace it by a heavy cord, putting a knot between each part.

D. *Control Stick:* Take a piece of wood about 8" in length and ⅛" thick. Make holes for head, thorax, abdomen and wings—pass string through holes and attach to loops. Each wing has a string which is to pass through the wing hole; so that there will be four strings in all. All four are tied into a single knot. When the knot is moved up and down the wings will flap.



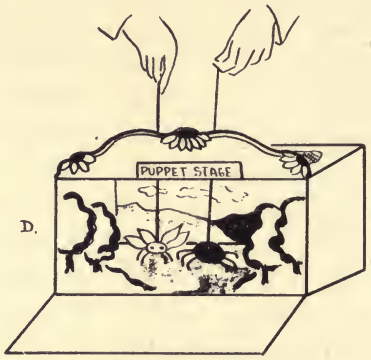


The Stage

A. Take an oblong carton about 20" x 12", cut off No. 4. Be sure to leave a border on the top of the box at least 3" wide.

B. Open up the folds of the box, using No. 1 for the top and No. 2 for the bottom. Nos. 5 and 6 are the inside flaps, and are to be used for scenery. Cut your design (as seen in figure B) on the dotted line.

C. The stage is now ready to be painted. Through No. 4 the puppets are inserted. The puppets are operated through No. 4. Nos. 1 and 2 are to be used as curtains which are "drawn" by closing the box as it was in figure A.



D. D shows the stage open ready for the play. It may have a quilt or other drapes hung above it to keep the manipulators from view.

Suggestions for Insect Plays

It should not be difficult to write an insect play as there is not only an opportunity for the study of insect life, but all kinds of dramatic situations can be introduced. The insect world has its sweethearts, heroes and villains very much as humans do, and the characters can arouse as much sympathy if the play is well written and presented in an interesting way. It is important to keep the characters as authentic as possible and the action basically factual as well as dramatic.

Study the habits of insects and fit your characters into their natural settings. For instance, the Butterfly with her wings of many colors could be a fickle heroine who lives in the sunshine, dashing from one flower to another. The Luna Moth, one of the most beautiful of all the insects, represents tragedy—she unfolds her wings for the first time in the darkest part of the woods, flies at night and lives only a few days. When it comes to heroes, why not choose the Bumble Bee with his pompous air, or picture the Cricket singing beneath the window of his lady. The Hornet and Preying Mantis are unmistakably villains and the Wasp, with his black shiny coat, could be the *blackest* villain of all.

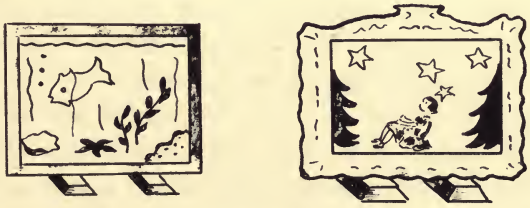
Recreational activities can also be considered among the insects. Imagine the Katydids as community singers, the Fleas as dancers, and try to think of others that imitate or change colors to pretend they are the actors. Surely the Grasshoppers play games as they hop about and the Butterflies are playing "hide and seek" as they hide behind the leaves and flowers from their brothers and sisters. Study the edges of streams and see which insects can swim.

A study of Housing could also be carried on in your study of insects. Follow the bed of a stream to see if you can find a Cadis Fly and observe it build a house of stone. It is easy enough to find a hornet's nest and make a study of a house built of paper. The Wasp lives in a house made of mud. The Bees build theirs of wax; in fact, the insects use almost as many mediums as man. Make a study of them and see which you would prefer to have as a landlord.

There is also a chance for the study of communal life if you want to take the time to work out a long term project. Make a study of the life of the ants with their division of labor, their slaves, warriors, etc. Life as it is lived in a bee hive would be fascinating to anyone that has never read about it before.

There are endless themes for insect plays and exciting ones too!

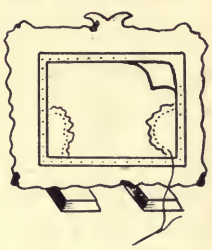
A Shadow Puppet Show



If you are going to give an evening program, a shadow puppet show is easy to construct, and if well lighted can be presented to an audience of several hundred people. If the audience is large, just remember to set the stage several feet above their heads to enable everyone to see more easily. You might call the show "Nature Graphs" because any phase of nature can be shown on the screen by means of small figures cut from cardboard. Pretend the screen is one side of an aquarium, add sea weed as scenery, and write a story about what you think the turtles and fish are doing. The above illustra-

tion shows a screen made of blue cellophane on which gold stars are pasted. The trees and figures made of cardboard. In this play the child asks the stars questions about themselves, and they come down out of the sky to answer her.

CONSTRUCTION



Frame: It is easy to improvise a frame for shadow puppets by fastening two blocks of wood three inches wide and six inches long to an old picture frame as shown in the illustration. Almost any attic can produce an old frame and the owner usually is glad to find a good use for it. If you cannot find one, construct a frame from 1″ x 2″ pine and nail the two blocks of wood on to the bottom so it will stand alone.

Screen: Muslin stretched taut and tacked around the edges of the back of the frame makes an excellent screen. Part of a white window blind also may be used to make the screen a little more transparent. If you want scenery in colors, cut it from crepe paper and sew or paste it onto the back of the screen. Use black paper on cardboard if you want the figures to be opaque.

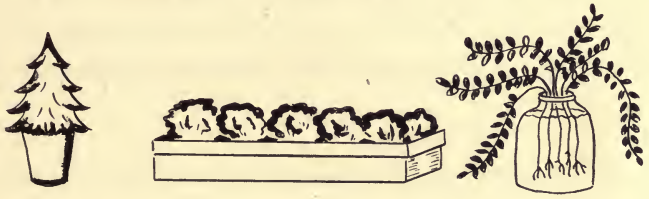
Puppets: First select your characters and draw an outline of your smallest puppet on a piece of paper. Then draw the others in proportion. Cut around the edge of your drawing and use it as a pattern. Decide what parts are to move, then cut those parts from the main puppet and cut another pattern making it half an inch longer so it can be attached again by means of a brass headed paper clip with the two prongs spread apart in the back. If you want your puppets to be black, make them of heavy cardboard or black construction paper. Colored ones can be done in two ways. If the characters are cut out of thin white paper, colored with crayons and then coated with clear varnish, they will be stiff enough to stand and keep their shape. The other way is to cut the inside out of the cardboard characters leaving only the outline, and cover with colored cellophane after pasting it around the edges.

To Manipulate: Cut sticks about one-fourth inch in diameter and twelve

inches long, then drill a small hole at one end. Attach it to the center of the puppet by sewing it on with a needle and thread, bringing the needle up through the puppet, then through the small hole at the end of the stick. Cut ordinary string a length of about fifteen inches and tie one to the center of every part that moves. To manipulate, hold the stick in one hand and the strings in the other. The puppets should always be held tight against the screen and care should be taken that the hands are not seen by the audience.

To illuminate the stage, use an electric bulb or several flashlights. You will have to experiment before the show to see just where to place them. You can do some interesting experiments in lighting by using colored crepe paper or cellophane over the lights. The lights should be placed between your hands and the screen.

NATURE CONSERVATION

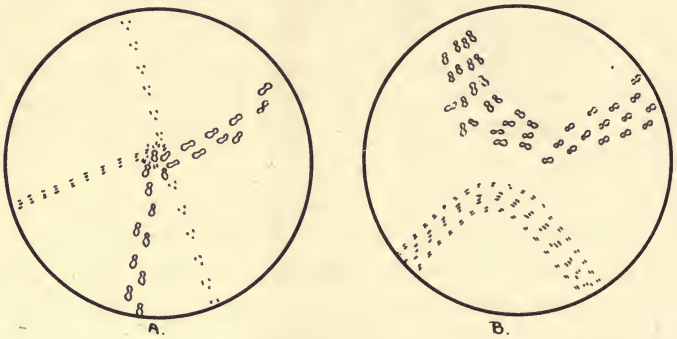


The dramatic groups are perhaps the outstanding offenders of nature conservation, both in camp and in the city. In their enthusiasm for getting the right kind of shrubbery and flowers with the correct coloring for their stage they often pick the rarest specimens. Why not work with the nature group and ask them to select greens that grow in abundance, or have them collect the ones you need.

There are a number of ways of preserving plants after they are picked which will enable you to bring them into the city, use them for a play, and then transplant them to a spot where they can grow. The above illustrations will give you several suggestions. Flowers and small plants will take root in water and then may be transplanted to flower pots as cuttings. Small trees should be dug up with plenty of dirt left around the roots and transferred to large buckets. They will stay green during the play and then can be planted in someone's yard. Small shrubs make attractive screens for footlights if placed in long narrow boxes and placed along the front of the stage.

In other words, keep the spirit of "The Living Christmas Tree" incorporated in selecting your stage properties!

ANIMAL TRACK CAMPFIRE



Divide everyone into groups of four or five and give them scissors and paper. Ask them to cut out animal tracks which they are later to place around in the center of the campfire circle in a way that will tell a story. Of course when one group places its tracks the other groups must try to interpret them. The two illustrations above might be interpreted as follows:

Diagram A

Mr. Rabbit was strolling leisurely through the woods one day when all at once Mr. Weasel, his most dangerous enemy, darted out from behind a tree and sprang at him. Just then a hunter came along and, seeing the skirmish, fired at them. He must have killed Mr. Weasel because there are no more tracks, and Mr. Rabbit ran away as hard as he could. (Note how far apart his tracks are.)

Diagram B

Two people must have been on a nature walk. Note how often they stopped along the trail to observe. All at once they came upon Mrs. Skunk and her two babies. See how quickly they moved to get away. Mrs. Skunk and her babies went equally fast in the other direction.

SIMPLE MASKS

Simple masks cut into the shapes of leaves or flowers may be used effectively to dramatize nature. Out of stiff cardboard cut the masks in the desired shape and paint it in the color of the nature object it represents.

One can paint the whole mask in color and add features with black paint, or simply paint only the outside and leave a white part in the center on which to paint a face. Fasten a stick 8″ long to the lower left hand corner of the mask so that it can be held in front of the face with the right hand. Cut small holes in the center of the mask so that a person can see through it. The person who is holding the mask should be dressed in green or brown to represent the stem of a flower or the trunk of a tree.

Section V—Nature in Music

THERE ARE MANY WAYS in which nature and music go hand in hand in song, rhythm, instrument making and singing games. When the primitive man made his musical instruments he must first have been a student of nature, otherwise he would not have known which plants had hollow stems for the making of reed instruments, which woods were hard to give a clearer tone, etc. During the evolution of musical instruments making, nature has played an important role in the use of shells, horns, barks, bones and many other materials too numerous to mention.

Bird notes and songs have formed the basic part of some of our sweetest music. There are many phonograph records available of bird songs which might be included in your repertoire of camp music. It will be found that the song of the Katydid or the Cricket makes an interesting study in rhythms.

Singing Games can be included in any nature program and are especially useful for rainy days. If you do not know one with a nature theme, ask the children to adapt one to a familiar tune and put in their own actions. The movements of animals, bird songs and names of flowers will give them enough source material.

Songs on the following subjects can be found at the end of the chapter with their publishers. Any of them can be turned into a singing game. Songs about: The Four Seasons; Water; Trees, Flowers, Plants; Birds and Insects; Animals and Fish; Moon, Stars, Sun, Clouds; The Weather and Hiking.

Body Rhythms—Have groups apply the fundamental rhythmic patterns of walking, running, skipping, swaying, etc., by creating the movements of animals, flowers or birds. Refer to Walter and Jenks—songs and games for Little Ones.

Music Craft—An activity through music, nature and craft can be correlated by stimulating the making of simple musical instruments.—Salis N. Coleman, Music Investigator—The Lincoln School of Teachers College, New York City, has made a comprehensive study of the making of musical instruments from natural materials and the following directions are taken from her book, "Creative Music in the Home." There are many more suggestions in the book which should be helpful to a group interested in making its own instruments by adapting the elements of nature to its own use.

CORNSTALK FIFE

Take a piece of cornstalk about ten inches long and one half inch in diameter. Run a hot wire through it to burn out the pith, and close one end with paraffin. Burn a hole near the closed end for blowing, and two others near the other end and this will give you a fife that will play three notes.

PANPIPES

The best material for constructing a set of panpipes is bamboo or hollow reeds cut into different lengths and laced together according to progressive lengths, with the shortest one at one end for the high note and the longest on at the other for the low note. The pitch changes chiefly according to the depth of the hollow space inside the pipe, which is varied by pushing down the pitch in a reed or altering the length of a bamboo.

Start with a piece four or five inches long. Test it for tone and cut the next one longer or shorter. By testing and changing, whole tone steps can be effected for an octave scale.

Most reeds are cut best with a saw unless one is adept with a knife, and should be smoothed with sandpaper. If the tone is too low for its place on the scale, it can be raised by filing down the length of the pipe. Sandpaper will shorten it very gradually. High notes cannot be lowered. If a mistake is made, such ones will have to be discarded or shortened down for a succeeding note.

A leather thong or strong cord will serve for lashing the pipes together.

GOURD INSTRUMENTS

Indian Rattle

An Indian Rattle can be made from a dried gourd. Open one end and insert some pebbles or grains of corn to make it rattle, then seal it with plastic wood. Decorate with Indian designs.

A Banjo

The Kentucky mountain children play on banjos made of dried gourds. If you want to make one, choose a gourd that is fairly large and has the general shape of a banjo. Cut one side off the bulging ends, empty out the seeds and cover it with oiled wrapping paper. Stretch it over the top as tight as possible and paste the edges with some good glue. String it up like any other banjo.

MARIMBA

Materials:

Flat strips of any well-seasoned wood, the finer the grain and the harder the wood the better, i.e., maple; 3 or 4 feet of soft rope; a few ½ inch brads.

Tools: Saw, plane, vise and hammer.

Take a flat strip of wood about 9 inches long and hold it lightly between the thumb and finger about ¼ of its length from one end. Tap it lightly with another stick. Identify its pitch. If it is too low, saw a little off of one

end, if it is too high, put it in the vise and plane off some of its thickness. Do the same with another piece of your wood that is about ½ inch shorter or longer. This should give you another tone. By experimenting a little you can soon get several tones right along the scale and tune them to definite pitches.

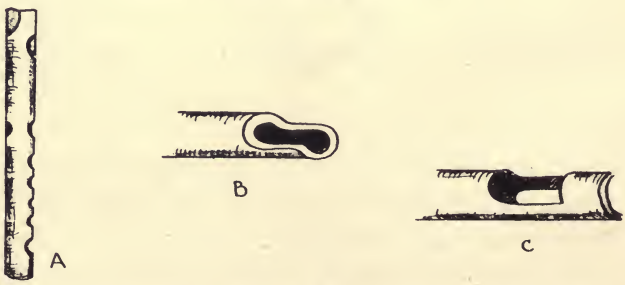
To make a hammer, cut a small block of your wood and whittle it round, or else just round off the corners and insert the end of a limber stick. A knot might be used for the block. Wrap a piece of felt around the block if you wish to soften the tones.

Lay the rope on a table in a U shape. Place your tuned pieces of wood across it. Find the nodal points by sprinkling sand or sawdust on your sticks and lightly tapping them in the center. The sand will finally collect in two little piles where the wood trembles the least. Mark the center of these—they are the nodal points. Place your rope so it goes just under these points on each stick. By laying the shortest stick next to the loop in the rope and the others about ½ inch apart, from each other across it you will have a loop to hold your marimba. The sticks will be graduated down it. Make the tune as many sticks as you wish in your instrument. Mark their nodal points, then nail the rope to these points with small brads on the back of your sticks. Now you can hang up your instrument to play it or lay it on a table. You'll find it more resonant to lay or hang against a large wooden surface—as on a table. Place a board on your lap and let it lay across, if you choose.

Petunia-Blossom Oboe

Remove the pistil from the flower, put two pinholes in the side of the tube, and by blowing through it a "three-note" melody can be played.

THE SHEPHERD'S PIPE



The shepherd's pipe is another reed instrument in which, by the use of holes, several tones can be made on one reed. The tone is generated by

blowing directly into a whistle mouthpiece at one end of the reed. Take a reed about 12 inches long and an inch or more in diameter and cut the top in the shape of a mouth piece as shown in Diagram A, and fit a cork that has been cut flat on one end into the top. Cut a rectangular window ⅛ inch in diameter about one inch below the top, also shown in the diagram. After the mouth piece is fit in bore two small holes opposite to each other about three inches below the window. Adjust the mouthpiece until you can get a tone. If the pitch is too low make the pipe shorter. Bore five other holes below the first one on top about ⅞ inch apart and tune them as you go. The pipe is tuned by making the holes larger.

SHELL TRUMPET

A trumpet can be made from a large sea shell, but the tones are so loud they are practical only for use in camp or out in the country. Bore a hole in the side of the shell or cut off the apex to blow in. They make a good gong for camp, or to signal with when on a hike.

A WISHBONE HARP

Stretch a narrow rubber band several times across a wishbone then pull it into tune and you can play a simple melody on your tiny harp. To make a harp on a larger scale than the wishbone one, cut a forked branch from a tree, put an equal number of notches in the sides of each prong and stretch several narrow rubber bands over them.

SQUASH-LEAF OBOE

To make this instrument cut the leaf with its stem from the plant, leaving the hollow stem intact. Then at the leaf end a slit about an inch long is

made in the stem. By inserting this entirely into the mouth and blowing through it, the two slit surfaces are made to vilirate together, creating a reedy sound. A hole about one-eighth the length of the stem from the big end will produce a tone above the fundamental. Another hole at nearly the same distance, and a third hole at about half that distance from the second, should complete the first four tones of the diatonic major scale. Several squash-leaf stems can be cut until they will produce lik tones, and they can then be used to make an interesting squash-leaf ensemble. If kept in water when not in use, these instruments will last for several days.

SONGS WITH NATURE THEMES

Plants	
Roll de Cotton Down	Universal Folk Songster
Peanut Picken Song	" " "
Oats, Peas, Beans & Barley	" " "
A Song of Bread	Concord #7
The Farmer	" "
The Grass	" #14
Animals & Fish	
My Pony	Concord #7
The Pony Ride	" "
On a Frosty Morning	" "
The Snail	Songs & Games for Little Ones
Eight White Sheep	" " " " " "
Little Prairie Flower	" " " " " "
Old MacDonald Had a Farm	Twice 55 Games with Music
Down on Smiley's Farm	" " " " "
The Monkey and the Zebra	" " " " "
The Barnyard Song	" " " " "
The Tree in the Wood	" " " " "
The Animal Fair	" " " " "
Seasons & Weather	
Winter	Concord #7
The Shower	" "
The Wind	" "
Tirra-lirra-lirra	" "
The First Snow Drop	Universal Folk Songster

Frost	Universal Folk Songster
Moon Song	Concord #7
The Stars	" #14
Man in the Moon	" #14
A Song of Seasons	" #14
The Climate	Twice 55 (Brown Book)
Who Has Seen the Wind	Play Songs by Laidlaw Bros.
To Three Forever	Universal Folk Songster
Moonlight	" " "

Water

The Banks of the Dee	Universal Folk Songster
Happy River	Concord #15
Singing River	" #15
Journey of the Leaves	" # 7
Evening on the River	" # 7
A Sailing Song	" # 7

Flowers & Trees

Come Buy My Flowers	Universal Folk Songster
Spring Calls	" " "
Out of the Meadow	" " "
Balzamina	
The Apple Tree House	Concord #7
Planting a Garden	" #7
My Garden of Flowers	Song & Games for Little Ones
The Daisy	" " " " " "
The Violet	" " " " " "
Little White Lily	" " " " " "
The Birch Tree	Botsford Collection
Cheery Blooms	" "

Birds & Insects

Pigeons & Fairies	Universal Folk Songster
The Song of the Rooster	" " "
Flying Cranes	" " "
The Cuckoo	" " "
Fireflies	Concord #14
The Sparrow's Nest	" # 7
The Nightingale	" # 7

The Cuckoo	Concord # 7
The Chickadee	" # 7
The Sea Gull	" # 7
The Caterpillar	" # 7
The Butterfly	" #14
Grasshopper Green	Songs & Games for Little Ones
The Song of the Bee	" " " " " "
De Ballet of De Boll Weevil	Botsford Collection
Jaybird	" "
The Peacock	" "

Hiking

The Foot Traveler	Girl Scout Song Book
Out on the Meadow	Botsford Collection
Tiritomba	Concord #14
Weggis Song	Botsford Collection

Section VI—Nature in Dancing

THERE ARE MANY variations of the dance program that groups interested in nature and dancing can work out together. Dancing always has been closely allied with nature in the working out of rhythms according to the movements of animals, the depiction of the different seasons, the imitating of flowers and so on.

By observation out-of-doors it is easy to interpret the actions of birds, the swaying of branches, quickness of thunder, coolness of rain and many other fantasies of nature.

Costumes and color schemes for productions can well be copied from nature—colors of the rainbow make a good color chart and the woods and field offers flowers of every hue. Beautiful color combinations can be designed from such insects as the butterfly or the beetle. Even the snake becomes fascinating when presented in rhythm and costume.

DANCES FOR SEASONS

Spring:

Dance of Spring	Mary Wood Hinman's Folk Dance Book #1						
Faun Dance	"	"	"	"	"	"	"
Greek Dance of Spring	"	"	"	"	"	"	"
Pipes of Pan	"	"	"	"	"	"	"
Spring Dance	"	"	"	"	"	"	"
Wood Nymphs	"	"	"	"	"	"	"
Butterfly	"	"	"	"	"	"	#2
May Pole	"	"	"	"	"	"	#3

Today is 1st of May	Mary Wood Hinman's Folk Dance Book #3
Fairies Revel	" " " " " " #4
Around the Tree	Folk Dances for Young People....Van Cleve
Spring	" " " " " " "

Winter

Christmas	Mary Wood Hinman's Folk Dance Book #4
A Winter Day	Folk Dances for Young People....Van Cleve
Christmas Frolic	" " " " " " "
The Sleigh Ride	" " " " " " "
The Snow Man	Come & Caper....Virginia Bennett Whitlock Pub. by G. Schirmer, Inc., NYC
Christmas Tree Song	Folk Games of Denmark & Sweden by Dagny Pederson & Neva L. Boyd Pub. by Saul Bros., 626 Federal St., Chicago, Ill.
Winter is Here	Good Times for All Times Nina B. Lamkin—Samuel French
Sleigh Bell Dance	Good Times for All Times Nina B. Lamkin—Samuel French
Santa Claus's Shop	Come & Caper....Virginia Bennett Whitlock
Skating	" " " " " "
The Snow Man	" " " " " "
Winter	" " " " " "

Summer

A Summer Day	Folk Dances for Young People....Van Cleve
Lost in the Woods	" " " " " " "
From Grain to Bread	" " " " " " "
'Mong Meadows Green	" " " " " " "
Mother's Flax	" " " " " " "

Fall

Finnish Harvest	Mary Wood Hinman's Folk Dance Book #4
Corn Grinding Song of Zuni	Rhythm of the Red Man....Julia Butree
Shoko Otiikwe	" " " " " " "
Harvest Dance of Zuni	" " " " " " "
Bow & Arrow of Woodcraft	" " " " " " "

Blue Corn Dance	Rhythm of the Red Man....Julia Butree
Harvest Dance	Dances of Finland....Eliz. Burchenal
Plowman's Waltz	" " " " "
Potato Peelings	" " " " "
Harvest Festival (Jewish)	Children's Succoth Celebration Pub. by National Council of Jewish Women
Garland	" " " " " " "
Indian Corn Dance	Come & Caper....Virginia Bennett Whitlock

Dances can be created by watching the flowers, birds and animals. Watching the peacock with his haughty air will inspire beautiful dancing movements. The study of the opening and closing of the petals of flowers will help to create not only charming dances but incite ideas for costumes to be worn for such dances. Of course imagination is a very necessary factor in visualizing the motive for such creations. What is more appropriate for a dainty "Polka" than the plucking of one petal at a time from the hardy daisy, pantomiming the old adage, "he loves me, he loves me not," at the same time fitting in steps to suit the music?

OTHER NATURE DANCES

Dance of the Seasons	Jewish Festival Book....Bureau of Jewish Education, 114 5th Ave., NYC
Rose Dance	Guild of Play Book of Festival & Dance by G. T. Kimmons
Spring Flower Dance	Guild of Play Book of Festival & Dance by G. T. Kimmons
Daffodills	Mary Wood Hinman's Folk Dance #3
The Farmer	" " " " " "
Garland	" " " " " "

Green Grass (Swedish)	Mary Wood Hinman's Folk Dance #3
Sweet Daisy (English)	" " " " " "
Our Garden Lily	Folk Dances for Young People, Van Cleve
	Character Dancing for School Programs by Hilda C. Kozman
The Rainbow Fairies	Good Times for All Times, N. B. Lamkin
The Flower Children	" " " " " " " "
Joy of Spring	" " " " " " " "
Pipes of Pan	" " " " " " " "
A Flower Dance	" " " " " " " "
Dance of Poppies	" " " " " " " "
Indian Corn Dance	" " " " " " " "

Blossoming Flowers:	Rhythmic Action Plays & Dances by Irene Phillips Moses
Autumn Wind	
Snow Cloud	
March Wind	
Sun	
Cloud of Gentle Spring Rain	
Butterflies (E. H. Grieg)	Come & Caper. . . . Virginia Bennett Whitlock
Forest & Storm (Pastoral" Symphony. . L. B. Beethoven)	" " " " " "
The Sea (Scotch Poem—E. MacDowell)	" " " " " "
Spring Comes (To Spring) (E. H. Grieg)	" " " " " "
Warm Wind Waltz (F. Schubert)	" " " " " "
Rain Drops (Little Prelude—J. S. Bach)	" " " " " "
Bear (Bird Music from 'Siegfried"—Wagner)	" " " " " "
Camel	" " " " " "
Cats	" " " " " "
Ducks	" " " " " "
Elephant	" " " " " "

The Bees	Folk Dances for Young People....Van Cleve
The Carrier Pigeon	" " " " " " "
Rabbits & Dogs	" " " " " " "
Hawk & Dove	" " " " " " "
The Crow	" " " " " " "
Fox & Geese	" " " " " " "
Four & Twenty Blackbirds	" " " " " " "
Doves	Mary Wood Hinman's Folk Dance Book #3
Small Herrings	Dances of Finland....Eliz. Burchenal
Frogs	Come & Caper....Virginia Bennett Whitlock
Kangaroos	" " " " " "
Lion	" " " " " "
Monkeys	" " " " " "
Rabbits	" " " " " "
Mules	" " " " " "
Seals	" " " " " "
Wild Man	" " " " " "

Section VII—Nature in Aquatics

NATURE AT THE SHORE

Dr. William Beebe, the naturalist, once wrote that the edges of things often reveal more about what things are made of than the things themselves. Just as you would examine the edge of a piece of cloth to learn its weave and what the warp and weft are made of, so Dr. Beebe examines the edges of nature. And what is a better place to examine nature than at the shore? The edge of three elements of nature are land, water and air.

The archaeologists dig up the refuse of lost civilizations to study and build up histories of ancient times. In a like manner we may examine the edge of the water for refuse telling us a little of what it contains and much about the flora, fauna and minerals of the land that has been washed down by the rains.

The third, and often most obviously important, element is the air and what it contains, sunlight, clouds, wind and rain. The air is the governing force that subdues or plays with the other elements at the shore. When it behaves to our liking and all is serene we hardly notice it at all, but when it ships the water into thundering surf and makes the trees moan, we call it weather.

Mark Twain once expressed himself to the effect that we all talked about the weather but nobody ever did anything about it. We still can't do much about it, but we can do many things with it. Just watching the weather can become an interesting pastime, and the study of weather is really a most fascinating subject.

We can study the weather to learn its moods and know whether it is just playful or getting serious. Whether it is time to head for shore if we are in a boat, or to stay in camp if we intended to go hiking or had planned a picnic or outing.

Weather maps are interesting to study and can be had by writing to the United States Weather Bureau Station nearest you. The maps will tell much about cyclonic storms and general weather conditions. However, do not expect them to forecast all the local squalls or thunderstorms.

There are a few instruments that can help us in our study of the weather—a weathervane, barometer and hygrometer. These can all be homemade, but unless you are quite expert with tools you had better buy the barometer —$3.00 up.

THE BAROMETER

This instrument is of little use and may actually give you wrong information unless you consult it regularly and keep a record of its readings.

The barometer contains a small metal box from which the air has been removed. The sides of the box cave in more or less from the pressure of the air on the outside of the box. The air pressure constantly varies, and is called barometric pressure. The side of the box is connected to a needle that moves back and forth registering the changes in barometric pressure. Each time you read the barometer you should tap the glass lightly in case the needle has stuck. Write the reading down and set the extra needle right over the moving needle. This is so that the next time you read the barometer you can tell at a glance whether it has moved up or down.

A Rising Barometer

A rapid rise indicates unsettled weather.

A gradual rise means settled weather.

A rise with dry air and cold increasing, in the summer indicates wind from the northward, and if rain has fallen better weather may be expected.

A rise with moist air and low temperature, indicates wind and rain from the northward.

A rise with southerly wind, indicates fine weather.

A Steady Barometer

With dry air and normal temperature, indicates continuance of fine weather.

A Falling Barometer

A rapid fall indicates stormy weather.

A rapid fall with westerly wind, indicates stormy weather from the northward.

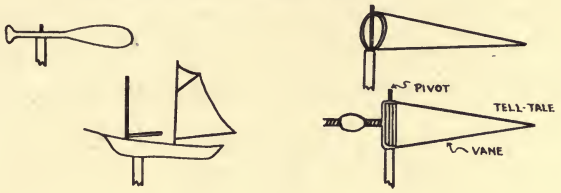
A fall with a northerly wind indicates storm; with rain and hail in summer, and snow in winter.

A fall with increased moisture in the air and heat increasing, indicates wind and rain from southward.

A fall after very calm and warm weather, indicates rain with squally weather.

After reading the barometer indications you can see why we need the other instruments mentioned.

THE WEATHER VANE



The Weather Vane to tell us which way the wind is blowing, and the hygrometer to tell us the temperature and how much humidity there is in the air.

The Weather Vane is the easiest of the instruments to make. It can be just a flag or a piece of cloth hung out in an exposed place where the unobstructed winds can blow it. Or, to be more exact, we can make our weather vane in a number of ways. We can make sailing ships, or canoe paddles, roosters or windmills. There is no end to the designs for weather vanes and perhaps you can make up a new one.

In constructing a weather vane of metal or wood, have as much *surface* behind the pivot as possible; you cannot have too much. You must, however, have as much *weight* in front of the pivot as the vane weighs behind it. In other words the weather vane must balance on the pivot as far as *weight* is concerned and be *out of balance in areas*. Often the telltale on sail boats is made like the illustration which explains this question of areas and weights.

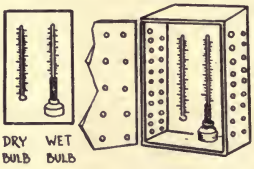
The pivot must be quite free and made of some noncorrosive material that will not rust fast, brass, bronze, nickel, silver, etc.

You can also make cross arms indicating the cardinal compass points and attach them just under the weather vane orienting them by a compass or the north star. They will help you to judge the direction of the wind.

THE HYGROMETER

The hygrometer consists of two thermometers fastened to a board. One, the dry bulb thermometer, is the ordinary household kind, the other, the wet bulb thermometer, is exactly the same except that the bulb is covered with

a cotton wick extending down into a small bottle of water. The two thermometers are mounted on a board and placed upright in a box that has had holes drilled in three sides to allow a free circulation of air and yet not allow too much wind to strike the wet bulb. This would cool the wet bulb too much and give an incorrect reading. The two thermometers will have to be bought, the rest of the instrument can easily be made with a hammer, saw, and brace and bit. In buying thermometers go to some store that has several on display, look them all over to find what the average reading is and purchase two whose readings are as near the average as possible.



The wet bulb thermometer gives you the temperature at 100% humidity and the dry bulb the temperature at the humidity of the air. By subtracting the wet bulb reading from that of the dry bulb and consulting the following table you can find out what the humidity is.

Room	Difference between Wet and Dry Bulbs Barometer 30.0																	
temp.	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
68 F.	80	76	71	67	62	58	54	50	46	42	38	34	31	27	23	20	16	13
69	81	76	72	67	63	59	55	51	47	43	39	35	32	28	24	21	18	14
70	81	77	72	68	64	59	55	51	48	44	40	36	33	29	25	22	19	15
71	81	77	72	68	64	60	56	52	48	45	41	37	33	30	27	23	20	17
72	82	77	73	69	65	61	57	53	49	54	42	38	34	31	28	24	21	18
73	82	78	73	69	65	61	57	53	50	46	42	39	35	32	29	25	22	19
74	82	78	74	69	65	61	58	54	50	47	43	39	36	33	29	26	23	20
75	82	78	74	70	66	62	58	54	51	47	44	40	37	34	30	27	24	21
76	82	78	74	70	66	62	59	55	51	48	44	41	38	34	31	28	25	22
77	83	79	74	71	67	63	59	56	52	48	45	42	39	35	32	29	26	23
78	83	79	75	71	67	63	60	56	53	49	46	43	39	36	33	30	27	24
79	83	79	75	71	68	64	60	57	53	50	46	43	40	37	34	31	28	25
80	83	79	75	72	68	64	61	57	54	50	47	44	41	38	35	32	29	26
82	84	80	76	72	69	65	61	58	55	51	48	45	42	39	36	33	30	28
84	84	80	76	73	69	66	62	59	56	52	49	46	43	40	37	35	32	29
86	84	81	77	73	70	66	63	60	57	53	50	47	44	42	39	36	33	31
88	85	81	77	74	70	67	64	61	57	54	51	48	46	43	40	37	35	32

Study the weather habits in your locality, there are many indications that will allow you to forecast weather a few hours in advance, without consulting instruments of any kind. A sudden change of wind, a rapid change in temperature, thunder-heads on the horizon, are all indications of weather changes. These should be known and recognized because often you might be on a hike or boat and not have the instruments we have mentioned.

There are no fixed rules for this kind of weather prediction. Each locality has its own peculiarity. For instance; on Long Island Sound, squalls often come up against a prevailing wind while, inland, the storms usually come with the wind. The writer has seen five squalls in one afternoon, rain on one side of the river and not on the other. In this locality the storms came down a tributary of a large river and turned down the main stream without crossing it.

There is a great deal of weather lore available in rime and prose peculiar to different localities. Much of it is inaccurate and based on superstition; however, sometimes there is a grain of truth to be found in them. Seamen used some of the following in the days of the windjammers:

Red sky in the morning
Sailors take warning.

Red sky at night,
Sailor's delight.

Nature Criteria

The following criteria is suggested for the Director, or Nature Counselor, who set the standards of a nature program for any recreational agency. It should be used as a basis for discussion in a training course rather than a series of rules to be followed without serious thought. It may also be valuable for use in a survey if you wish to evaluate a nature program.

NATURE FACILITIES

Nature Facilities might be: Outdoor museum, trail, nature house, garden area, windows, nature nook.

1. They should be kept attractive and clean.
2. When living things are kept in them, they should have the proper care.
3. All displays and specimens should be labeled in an interesting and thought-provoking manner as possible.
4. All displays should be of local material—(not tropical plants, ones that grow in the far north or ones might be found in darkest Africa, for instance).
5. There should be water available for plant specimens and provide water for living animals.

LEADER

1. A leader should have good health which stimulates energy and enthusiasm.
2. A leader should have common sense and sound judgment, especially if the program is to be conducted in the field.
3. The leader should be attractive in appearance and wear suitable clothing, such as comfortable shoes and sport clothes on a hike.
4. A leader should be dependable. If a group is out on a hike, the leader is responsible for getting them home at a given time.
5. A leader must have the training requisite for carrying out the program.
6. A leader should be sincerely interested in children.
7. A leader should know something about the interests of different age groups, and how to adapt the program to these interests.
8. A leader should have a spirit of adventure and be alive to the interesting things in the world of nature around him.
9. A nature leader should be versatile and join in other camp activities.

PROGRAM

1. The leader should be able to offer the group a definite program with enough flexibility to meet emergencies.

2. The basis of a nature program should be to give a knowledge and enjoyment of *living* things and the *way* they live.

3. A nature program should stimulate children to inquire and become aware of things growing around them, rather than to know the names of every single object. An appreciation comes through acquaintanceship with some things and an awareness of all things.

4. Children should be guided toward an understanding of a living thing and appreciate its beauty without desire for possession. In other words, do away with collections and keep a record with drawings or photographs. Always encourage conservation of plants and animals which is necessary both in the city and in the country.

5. A nature program should be planned as a group activity and yet for the individual student.

6. There is no hard and fast grouping of nature students according to age. A six year old may study with an adult if neither has been introduced to nature, except perhaps on long hikes.

7. A nature program should be based on every seasonal change.

8. There should be a diversity of activities introducing the different fields of nature.

9. A nature program should bring out the major principles such as conservation, life histories, interdependence, adaptations and use by man.

10. The program should be motivated by the use of nature displays, visual aids, nature crafts, source material.

11. Awards and tests may have a place in the nature program, but must be used with discretion lest acquiring or passing of them become the goal and not a means to the goal of nature appreciation.

12. The program should be one of active participation rather than a lecture period and should lead the individuals to discover for themselves whenever possible.

NATURE ACTIVITIES

1. Hikes.

2. Special Field Trips: zoo, museum, push carts, fish markets, botanical gardens, neighborhood observations, stores, trees, gardens, open lots.

3. Crafts: splatter prints, blue prints, Van Dyke prints, plaster casts,

photography, winter gardens, bird houses, animal cages, notebooks, textile with nature motifs, sketching, painting, basketing, carving, sculpture.

4. Games: Games with equipment (indoor and outdoor), games without equipment (outdoor).

5. Special Events: flower shows, pet shows, exhibits, museum days, hobby days, conservation week, Arbor Day, Kindness to Animals Week, Bird Week, all other special days such as ground hog, May Day, first day of Spring, Summer, Fall and Winter.

6. Source of Help: library, teachers, nature hobbyist, pet shop owners, national nature organizations, market and store owners, films and slides, museums, botanical gardens, free literature, supply houses, State and Federal nature publications.

Bibliography

The following list of books are selected as suitable for use in a camp library or nature room and should not be considered a complete bibliography. The list is limited in number to make it more usable for the lay person who is receiving his first introduction to nature, or for a person who is not a naturalist, yet selects books for libraries.

NATURE MAGAZINES

American Forests, Washington, D. C.

Bird Lore, National Association of Audubon Societies, New York.

Conservation, American Forestry Association, Washington, D. C.

Frontiers, Philadelphia Academy Natural Sciences.

Monthly Evening Sky Map, Leon Barritt, 244 Adams St., Brooklyn, N. Y.

National Geographic Magazine, Washington, D. C.

Natural History, bi-monthly, American Museum of Natural History, New York.

Nature Magazine, Washington, D. C.

Recreation (National Recreation Association, New York City). Contains occasional articles on nature recreation and a monthly page of Nature-Grams by Dr. William Gould Vinal.

Rocks & Minerals, Peekskill, N. Y.

Zoological Society Bulletin, bi-monthly, Zoological Society, New York.

Publications of State Museums and of other sources, such as the Museum of Natural History, Field Museums, etc. Superintendent of Documents, Washington, D. C., has lists from which to select materials.

BOOKS OF GENERAL INTEREST

Price, Betty, *Adventuring in Nature.* Suggestions for collections, playground nature museums, nature trails, nature clubs, games and handcraft, and other interesting activities for children.

Boy Scouts of America. Write for a list of their publications, 2 Park Ave., New York City.

The Outdoor Book, Campfire Girls, 197 Greene St., New York City. A section on nature games and natural foods.

Comstock, Anna, *Handbook of Nature Study,* Ithaca, N. Y. Slingerland-Comstock Co. A standard handbook for nature leaders.

Gaudette, Marie. *Leader's Nature Guide,* Girl Scouts, Inc., 155 East 44th St., New York City. An attractively illustrated booklet containing many fascinating suggestions for nature activities that will interest young people.

Howes, P. G., *Backyard Exploration,* New York: Doubleday, Doran Co. Particularly interesting and valuable because it so vividly expresses the results and pleasure to be obtained from careful study of a limited area. Well illustrated.

Mann, Paul, and Hastings, Geo. T., *Out of Doors, A Guide to Nature,* New York: Henry Holt Publishing Co. A book that interprets living things in the out of doors environment, animals and plant life, earth and sky with chapters on trails, museums, photography, stories, games, camp programs, etc.

Marshak, Ill. *100,000 Whys.* Philadelphia: J. B. Lippincott & Co. Explain in a simple way the "Why" of things seen in a trip around a room, such as the water faucet, the stove, the contents of the cupboard, etc.

National Recreation Association, 315 Fourth Ave., New York City. *Victory Gardens—Harvesting and Drying,* by Marguerite Ickis. Suggestions for drying vegetables, fruits, and herbs with the use of simple equipment, and for making gift packages and containers for herbs.

Needham, James G., *Natural History of the Farm,* Ithaca, N. Y.: Slingerland-Comstock Co. Contains excellent material on familiar animal and plant life.

Reed, W. M., *And That's Why,* New York: Harcourt, Brace & Co. Answers questions as to the "Why" of clouds, frost, fire, atoms, water, rocks, thunder and the waves in the air.

Stevens, Bertha, *Child and Universe,* New York: John Day & Co. A stimulating, splendidly illustrated book for the teacher or leader and the child who loves books. See the chapters: "Why Study the Universe?" and "The Earth in Space."

Vinal, William Gould, *Nature Guiding,* Ithaca, N. Y.: Slingerland-Comstock Co. A book filled with excellent suggestions on method and personal experiences; not well organized.

Vinal, William Gould, *Nature Recreation,* McGraw-Hill Book Co., New York City. A readable and practical guide for group leaders working with children out of doors.

AMPHIBIA

WRIGHT, ANNA ALLEN AND ALBERT HAZEN, *Handbook of Frogs and Toads,* Ithaca, N. Y.: Slingerland-Comstock Co. The frogs and toads of the United States and Canada. Well illustrated with photographs accompanying each description. Each species discussed under common name, scientific name, range and habitat.

ANIMALS

SHAW, MARGARET AND FISHER, JAMES. *Animals as Friends and How to Keep Them.* E. P. Dutton and Company, Inc., New York City, 1940.

ASTRONOMY

OLCOTT, W. T., *Field Book of the Sky,* New York: Frederick A. Stokes Co. One of the best sky books. Many diagrams and photographs. The information is arranged for naked eye, field glass and small telescope observation.

WILLIAMSON, JULIA, *The Stars Through Magic Casements,* New York: Appleton-Century Co. Star stories from the Greeks and native races together with modern poems. Excellent for the camp and council library.

BIRDS

ASHBROOK, FRANK, *Birds of America,* Racine, Wis.: Whitman Publishing Co. Illustrated in color. I, The Green Book—Tanagers, Warblers, Thrushes, etc. II, The Red Book—Diving, Swimming, Marsh, Shore, etc. III, The Blue Book—Swifts, Flycatchers, Finches, etc. Excellent guides for beginners.

The Audubon Guide, *Attracting Birds,* Edited by John H. Baker, Executive Director of the Audubon Society 1941 (Doubleday Doran and Company, Inc., Garden City, N. Y.).

BROOKS, ALLAN (Illustrator), *Audubon Bird Cards,* New York: National Assoc., of Audubon Soc. Three sets of cards in color with text by Alden H. Hadley.

CHAPMAN, FRANK M., *Handbook of Birds of Eastern North America,* New York: D. Appleton-Century Co. One of the most helpful books written on birds.

FERNS AND THEIR ALLIES

WILEY, FARIDA, *Ferns,* New York: American Museum of Natural History. A pocket guide for New England and Middle Atlantic States.

FISHES

MELLEN, IDA M., *1001 Questions Answered About Your Aquarium,* New York: Dodd, Mead Co. Information about goldfish and toy tropicals, with details of care and treatment of ailments.

The Book of Fishes, Washington, D. C.: National Geographic Society. Life stories of the most important American game and food fishes.

FLOWERING PLANTS

GEORGIA, ADA E., *Manual of Weeds,* New York: Macmillan Co. Standard manual for northeastern United States.

GRAY, ASA, *Manual of Botany,* New York: American Book Co. Standard manual for central and northeastern United States.

HARVEY, JANE, *Wild Flowers of America,* Racine, Wis.: Whitman Pub. Co. Good pocket guide, colored pictures, distributed by Woolworth Ten Cent Stores.

The Book of Wild Flowers, Washington, D. C.: National Geographic Society. Includes color plates and brief descriptions of 25 familiar wild flowers and grasses. Chapter on state flowers.

FLOWERS

FISCHER, HELEN FIELD AND HARSHBARGER, GRETCHEN, *The Flower Family Album* (University of Minnesota Press, Minneapolis, 1941).

FUNGI

MARSHALL, NINA L., *The Mushroom Book,* Garden City, N. Y.: Doubleday, Doran & Co.

GEOLOGY

LOOMIS, G. P., *Field Book of Common Rocks & Minerals,* New York: G. P. Putnam's Sons. An excellent book for the beginner and advanced collector.

Wodiska, J., *A Book of Precious Stones,* New York: G. P. Putnam's Sons.

Swengel, H. & L., *The Romance of Your Birthstone,* Ithaca, N. Y.: Slingerland-Comstock Co.

INSECTS

Beard, Daniel Carter, *American Boys' Book of Bugs, Butterflies, and Beetles,* Philadelphia: J. B. Lippincott & Co. This is a good book; a useful, entertaining, well illustrated volume that belongs in the library of every boy and girl.

Lutz, Frank Eugene, *Field Book of Insects,* New York: G. P. Putnam's Sons. Especially suited to the study of insects in the northeastern United States.

Our Insect Friends and Foes, Washington, D. C.: National Geographic Society. Stories about the lives of bees, ants, beetles, bugs, butterflies, etc.

MAMMALS

Beard, Daniel Carter, *American Boys' Book of Wild Animals,* Philadelphia: J. B. Lippincott & Co. The writer has long been a favorite for young people.

Blair, William Reid, *In the Zoo,* New York: Scribner & Sons. Written with the understanding of a man who has taken pride in the development of his "animal children" for more than twenty-seven years.

MOSSES

Marshall, N. L., *Mosses and Lichens,* Garden City, N. Y.: Doubleday, Doran & Co. One of the few books describing the common lichens.

REPTILES

Ditmars, Raymond L., *The Book of Living Reptiles,* Philadelphia: J. B. Lippincott & Co. Written for young people.

TREES

Harlow, William M., Ph.D., *Trees of the Eastern United States and Canada* (Whittlesey House, McGraw-Hill Book Co., Inc., New York City).

Kauffman, Erle, *Kingdom of the Trees* (Reilly and Lee, Chicago, 1940).

MARX, DAVID S., *Let's Look at the Plant World* (The Botanic Publishing Co., Cincinnati, Ohio).
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The American Book of the Woods, 1941.

TREES AND SHRUBS

BLAKESLEE, A. F. AND JARVIS, C. D., *Trees in Winter—Their Study, Planting, Care and Identification,* New York: Macmillan Co. Excellent illustrations with buds, bark and general account of trees in northeastern United States.
HOTTES, ALFRED C., *The Book of Shrubs,* De La Mare & Co. Excellent account of the shrubs in cultivation, with information of their planting and care.
HOUGH, ROMNEY B., *Handbook of Trees of the Northern States and Canada,* Lowville, N. Y.: R. B. Hough. Excellent photographs of flowers, fruits, trees.

WATER LIFE

BUTLER, EVA L., *Along the Shore,* New York: John Day & Co. Brief accounts of the animal and plant life commonly found along the shore. Each description accompanied by drawings of a species. Good for very young.
FULLER, RAYMOND T., *Among the Brooks,* New York: John Day & Co. A very simple guide to fifty "Brook Denizens anyone is likely to meet with by any stepping stone brook." Good for beginners.
ROGERS, JULIA ELLAN, *The Shell Book,* Garden City, N. Y.: Doubleday, Doran Co. This popular guide to the living mollusks serves in the identification of shells both native and foreign.

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U. S. WEATHER BUREAU, *Cloud Forms,* Washington, D. C.: Superintendent of Documents. Excellent chart of various cloud forms.
WILLIAMS, LOU, *The Weather Handbook,* New York: Girl Scout, Inc. Written for the layman. A small book well illustrated.